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TRANSACTIONS & STUDIES

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(April 1943)

The Role of Surgery in the Chronic Arthritic Patient[1]

By PAUL C. COLONNA, M.D.

Professor of Orthopaedic Surgery, University of Pennsylvania

THE process of evolution in the treatment of the chronic arthritic patient has been of slow growth and the value of operative surgery has assumed increasing importance in the past decade. With the more careful selection of patients for surgery and the improvements in the technique of joint surgery, the rehabilitation of many adult cripples suffering from this disease has been achieved.

Many surgical procedures originally devised for the correction of joint deformity in non-arthritic conditions have been found applicable for use in certain types of chronic arthritis. I shall try to review briefly the pathological picture of this widespread disease and discuss some of the mechanical and surgical principles that are involved in treating chronic arthritis involving the hip and knee joints.

PATHOLOGY

In discussing a condition whose chief manifestation is a chronic joint irritation, the simplest possible nomenclature has been chosen although I am aware that it may not be entirely conclusive or satisfactory. We have chosen to discuss the subject on a pathological basis in order to keep in mind certain characteristic features of the two main types of chronic arthritis—proliferative, rheumatoid or atrophic, and the degenerative, osteoarthritic or hypertrophic—rather than to consider the subject upon an etiological basis. These two main divisions present important differences and, although we must recognize in the clinical picture that joints may possess evidence of both types of pathology, we feel that this fundamental classification possesses striking pathological and roentgenographic differences that are familiar to most physicians.

In 1909 Nichols and Richardson published the first careful laboratory study based on autopsy material and fresh specimens removed at operation. Their contribution is still a landmark in the pathological approach to chronic arthritis. In brief, as they and others have since pointed out, the proliferative type involves primarily the soft tissues surrounding the joint and follows the pattern of an inflammatory process. This type is predominantly found in the first four decades of life. In this type the smooth, glistening joint surfaces are gradually encroached upon by a pannus formation of granulation tissue which creeps in from the periphery toward the weight-bearing areas of the articular cartilages and death to these underlying surfaces occurs. Ultimately these joints often undergo bony ankylosis.

This picture is in marked contrast to the degenerative type of arthritis which is essentially a process of tissue degeneration. In this type

[1] Nathan Lewis Hatfield Lecture XXVII, The College of Physicians of Philadelphia, February 3, 1943.

early change seen in the articular cartilage is represented by the appearance of a yellowish hue to the articular cartilage and fibrillation of the joint surfaces. The weight-bearing portions of the joint undergo an attritional change with eburnation of the opposing joint surfaces and lipping of the marginal areas of the joint, the degeneration appearing first in those portions most subject to the pressure and strain of weight-bearing. This degenerative type is found most frequently in the latter half of life and is primarily not an inflammatory process. It would appear to be the effect of repeated trauma to tissues that have not the ability to withstand the wear and tear to which they are subjected. There is a restriction to motion in this type but not bony ankylosis, although occasionally abundant exostoses may fuse one with the other, producing a type of extra-articular bony fusion.

It is obvious, then, that both of these major processes produce joint deformity and both require mechanical and surgical aid in preventing and correcting the structural deformities that develop. I will not attempt to discuss the complicated subject of arthritis as a whole except to say I feel that the care of the arthritic patient in the early stages is primarily a medical problem in which are included metabolic, dietary, and toxic factors and that shortly after the onset of this disease the problem of preventing and correcting impairment at the articulations becomes a real one. Fortunate indeed is the arthritic patient if his care is supervised by an internist with broad experience and well-balanced judgment who will see to it that his patient avoids the many cure-alls and experimental novelties that are so often enthusiastically and blindly employed in the treatment of chronic arthritis.

The orthopaedic surgeon should be chiefly responsible for the prevention of deformities and the correction of any joint deformity which has developed. The importance of this prevention phase cannot be over-estimated and it should be begun early. Once the structural joint changes are established, they are most difficult to correct and this is particularly true in the cases with rheumatoid arthritis. Here the persistent contractures include especially the capsule and other periarticular soft tissues. Light metal or plaster splints or bivalved plaster casts which will permit the support to be removed at intervals are ideal, and in addition the proper measures of physical therapy should be instituted, simultaneously with the supportive care of the part. This means that the support preferably should be made for the individual patient and to do this the physician must be familiar with proper padding and with proper application of splints in order to avoid the complications of ill-fitting plaster casings or braces. Many of the severe contractures can be prevented or lessened by putting these joints at complete rest or by permitting such limitation of motion as seems desirable with removable braces. At times these measures may have to be preceded by adequate skin or skeletal traction carefully applied in the line of the deformity. In the cases of rheumatoid arthritis in which ankylosis may be anticipated to be the end result, the attitude of election must be decided upon. Therefore, in these patients that are limited in their activity because of joint disease, the physician may still salvage a great deal if the limbs are only maintained in a satisfactory position for erect weight-bearing.

Physical therapy is one of the most important measures in the treatment of the chronic arthritic and is of especial value in the degenerative type. Local heat to the part, whether it be applied on the surface by radiant heat or to the interior of the joint by diathermy or a similar modality, combined with the intelligent use of massage to the muscles that move the joint, will delay muscle atrophy and restore the tissues to improved local metabolism. These measures will increase the local circulation and prevent muscle contracture to a great degree.

If the deformity has become marked, or has been long existent, its correction may be best obtained by careful manipulation under anaesthesia with frequent changes of the external support during the period the periarticular tissues are undergoing stretching and relaxation. It is therefore usually wise to precede any surgical intervention by proper splinting and corrective muscle training exercises delaying, as a rule, any operative procedure until the disease has been inactive for at least a year.

We see, therefore, that the deformities in the chronic arthritic patient can be treated by many valuable, non-surgical measures but, within recent years, this type of patient has also been able to receive definite benefit from certain operative procedures. We may ask ourselves, "What is the rôle of surgery in the chronic arthritic patient?" In the first place, it should be stressed that a careful evaluation of the patient's general

health, age, occupation, etc., as well as a consideration of the problem presented at the joint or joints involved, must precede any operation. Each case must be judged on an individual basis and it must be remembered that not all cases are suitable for surgery. While a particular procedure may be of proven value, it may be contraindicated in the face of other factors.

CONSIDERATION OF MECHANICAL FACTORS

As we gradually assumed the upright attitude in our evolutionary development, the forces of stress and strain were greatly increased in the weight-bearing joints, such as the spine, hip, knee and foot. It is of importance to note that we usually develop the most striking evidence of chronic arthritis in these joints. I should like to discuss two of these weight-bearing joints, the hip and the knee, for in these two regions we can demonstrate the principles for many surgical procedures that have been devised to alleviate pain and to correct the deformities produced by chronic arthritis.

Hip Joint. In a study of the anatomy of the hip joint we can soon be convinced that this joint was constructed to furnish both stability and mobility to the individual. Any affection, whether it be due to injury or disease, that interferes with these two functions of the hip will give rise to pain and deformity. The hip joint is of the ball and socket type of articulation and when it becomes the seat of either a proliferative or degenerative arthritis there are produced changes in the gliding surfaces of the articular cartilages and supporting tissue that give rise to deformity. The hip is ordinarily a stable mechanism and the muscles producing its normal movement give balanced power and rhythm to our walk. When this balanced movement is interfered with, whether it be due to intra- or extra-articular causes, the patient develops a limp. If the limp is due to intra-articular cause, as in chronic arthritis, deformity at the hip joint will appear early. In our normal walking we move our hip into flexion and extension and in addition swing the limb in a small arc of abduction at each step. If there is an arthritis the joint cartilages soon become involved and stiffness, pain and deformity result. When this occurs the unprotected hip will be pulled into an attitude of flexion and adduction by its stronger group of flexor and adductor muscles and it is this attitude which is inconsistent with satisfactory weight-bearing and which interferes so seriously with the patient's activity.

This flexion-adduction deformity attitude therefore must be corrected to lessen the stresses and strains of weight-bearing, for it can be easily demonstrated that a person can walk surprisingly well with a perfectly ankylosed hip *providing* the limb is in the attitude of election. This is very slight flexion and abduction. At times an open operation may be necessary to correct this deformity at the hip and for this an osteotomy type of operation is one of the simplest. This is extremely useful in certain cases of osteoarthritis or rheumatoid arthritis. The operation may be of several different types, but its essential feature is a division of the femur at the level of the lesser trochanter and placing the limb in plaster of Paris in its position of election. This immobilization is continued for six to eight weeks or until the osteotomy is united by bony union. This simple type of surgery is very effective in restoring the lower extremity to a useful, weight-bearing attitude, and thereby lessening pain and disability. In certain arthritic hips in which deformity may or may not be present, but pain is complained of both with or without weight-bearing, it may be necessary to operate solely for the relief of pain. In these cases an arthrodesis of the hip joint is of definite value. This consists of surgically removing all motion in the joint. The operation as a rule is more suitable for the younger type of patient because it always requires a long period of postoperative immobilization to obtain a solid bony fusion at the hip joint. In certain cases of osteoarthritis there may be obtained a definite increase in the local circulation of the head of the femur by the so-called "drilling" operation. This procedure is based on the assumption that, if the blood supply to the head can be improved, the repair process can be stimulated and the progress of the degenerative arthritis slowed down.

Arthroplasty is another procedure that is useful in the ankylosed or partially ankylosed hip. This consists of interposing some medium, such as fascia lata, vitallium cup, etc., between the reshaped head and acetabulum so that there is produced a fairly normal configuration of the joint. The post-operative care of these patients is a long, tedious process but is essential to the reestablishment of controlled motion in a previously ankylosed hip. In selected cases of osteoarthritis the acetabuloplasty of Smith-Petersen has been

occasionally recommended. This consists briefly of removing a portion of the anterior rim of the acetabulum along with its attached capsule, which gives increased freedom of movement in the arthritic hip and lessens the pain in some cases of malum coxae senilis. The Whitman reconstruction operation has also been recommended in selected cases of osteoarthritis of the hip and this procedure aims at relieving pain, checking the progress of the degenerative process, and preserving a fair range of motion.

Another procedure which is at times useful is simple excision of the osteophytic fringe of bony spurs that may develop around the acetabular margin or head of the femur. This may permit an increased range of joint motion and lessen the disability, for a time at least, in certain cases of degenerative arthritis. Occasionally one may find one or more loose bodies free within the joint giving rise to mechanical disability, pain, and occasional locking. Excision of these loose bodies is a simple surgical procedure which usually removes the disability but does not of course prevent the subsequent formation of other loose bodies.

One other procedure which should be mentioned is the pseudoarthrosis operation of Sir Robert Jones. This consists of chiseling off the greater trochanter of the femur with its muscle attachments and fusing this bone to the femoral neck to produce a false joint. This pseudoarthrosis has been recommended for preventing pain in cases of osteoarthritis of the hip.

Knee Joint. The knee is one of the most important joints in the body and because it depends so largely for its integrity upon its ligaments and muscles, injuries to the soft parts frequently give rise to joint difficulties. The function of this joint is that of support and mobility, it being a modified hinge type of joint with a small amount of rotation between the femur and the tibia. This movement of rotation could be ignored except for the fact that joint disability is so frequently associated with it. The lateral condyles are broader and flatter than the medial, and they receive a more direct thrust in weight-bearing. The posterior portion of the condyle is very sharply curved to permit increased speed in action. The synovial membrane, which is the largest in the joints in the body, the cruciate ligaments and the semilunar cartilages add much to the complexity of this joint, producing opportunities for arthritic changes. The undersurfaces of the patella and the articulating surfaces of the femur show the earliest pathological changes in chronic arthritis.

Complete extension of the knee is one of the last joint developments achieved in the human and, therefore, it is one of the earlier functions lost. A small amount of fixed flexion contracture can be a very disabling deformity and will develop early in the proliferative or degenerative types of arthritis. Conservative measures of prevention, such as splints, braces, etc., must be early directed toward retaining full active extension. If these measures fail to correct contractures, the joint can be manipulated under anaesthesia and the posterior soft tissues stretched. Open operations, such as tenotomies, capsulotomies, fasciotomies, are all employed in the correction of contractures. At times a supracondylar wedge osteotomy will retain the residual movement at the articular surfaces of the joint and yet permit the limb to be used in full extension during weight-bearing. Certain arthritic joints may present so much pain and articular destruction, however, that a painless weight-bearing part cannot be hoped for. In these instances, surgical fusion of the joint, which sacrifices all motion, is of more practical value to the patient than a movable, painful one. This is particularly true in the laboring type of individual in which heavy work may be a necessity. This type of patient will often prefer the inconvenience of a perfectly stiff knee to one that is constantly being strained and painful during his daily work. In this connection, the problem of the most desirable attitude in which an ankylosed knee will be of most practical value must be considered by both the surgeon and patient. In some instances a perfectly straight, stiff knee will have certain advantages and in others a slightly flexed ankylosed knee will be desired. The position of election can often be decided by the patient himself. Genu valgum or knock knee also is an attitude of weakness and will give rise to chronic stress and strain of the ligaments along the inner side of the knee. At times one must even begin by correcting or improving a flat footed attitude for this also can be a contributing factor to pain in or about the inner side of the knee.

In the contracted knee joint with good articulating surfaces, as revealed by x-ray, simple tenotomy of the contracted tendons, or a capsulotomy, i.e., stripping of the posterior capsule away from the underlying bone to allow it to attach at a

somewhat lower level will permit contractures of a rather marked degree to be easily corrected. This posterior capsulotomy of Wilson is a most useful operation in selected cases.

Occasionally multiple loose bodies are found in cases of chronic arthritis and these are particularly noted in the degenerative type of arthritis. They may cause mechanical locking of the joint and require removal, whether located in the anterior or posterior portion of the joint. Care must be taken to remove all of the bodies noted in the preoperative x-ray and this, at times, may require opening both the anterior and posterior compartments of the knee. An x-ray taken at the operating table should be checked with the preoperative film, for this may save the operator the embarrassment of leaving one or more loose bodies within the joint which are not easily visible. We have often forced some of these loose bodies away from the synovial crevices by injecting under some pressure a syringe full of normal saline solution into the open joint.

A few years ago Burkheiser advocated removal of the entire patella in certain selected cases of hypertrophic arthritis of the knee joint and reported eleven cases, all of which showed a surprising degree of function following this operation. This author points out that the patella, while a sesamoid bone, is neither developed in nor actually situated in the quadriceps tendon but is developed independent of and occurs behind the tendon, as has been shown by the study of a 50 mm. embryo. This procedure of total patella removal may seem a rather radical one in cases of hypertrophic arthritis but its removal has been advocated by many operators, among them Brooke, Thompson, Blodgett and others, with most satisfactory results and is definitely advisable in some cases. Cases for operation should be selected only after less radical measures have been unsuccessfully employed and the disease is quiescent. Under these conditions removal of the patella permits a good range of motion, diminution of pain and a surprisingly stable knee.

The exact opposite of an arthrodesis is an arthroplasty of the joint and this occupies a small but important part in certain cases of chronic arthritis presenting ankylosis in the joint. The orthopaedic surgeon should, therefore, have at his disposal the indications and contraindications for this type of operation. An important factor in all arthroplasties is that the muscle tissue surrounding the joint must be of sufficient tone and strength to move the newly made articulation after the operation. For this reason, it is far better to spend the necessary amount of time to improve the tone of the muscles *preoperatively*. In considering the question of arthroplasty in any region, it goes without saying that if there is any evidence of local swelling or inflammation present, arthroplasty must be delayed, for the infection may be relighted by such a major procedure. This operation should not be advised lightly, but where there is a painless, ankylosed joint with good muscular potentialities, the procedure may offer a great deal, particularly so if one selects the patient that will consistently and persistently carry out the postoperative exercises.

There is one other operative procedure which is of great value in chronic arthritis of the knee and that is synovectomy. While surgical removal of the synovial membrane may be considered in a number of different conditions, it is particularly applicable in cases of chronic arthritis of the knee joint in which there is found a thickened synovial membrane with a chronic synovitis which has failed to respond to conservative treatment. When the infection is monarticular the results from this operation are very much more satisfactory than in those cases of multiple joint involvement. Boon-Itt, in an end-result study of knee synovectomies, gives a splendid review of 237 synovectomies, 60 per cent showing improvement in cases of polyarthritis and 75 per cent when only one knee joint was involved. The results in this large series of cases were based on the relief of pain, the ability to bear weight, and the fact that only those knees with a postoperative range of motion greater than 70 degrees were classed as satisfactory. Following the operation and early motion of the joint, Nature substitutes a synovial-like lining to these joints and this accounts for the increased range of motion that many times follows, transforming the boggy, thickened, painful joint with limited motion into a satisfactory, weight-bearing one. The results in selected cases are so satisfactory and the operative technique so simple that the procedure should be more widely employed in monarticular chronic infections in the knee joint.

CONCLUSIONS

In conclusion therefore—First: Chronic arthritis is characterized chiefly by a proliferative and/or a degenerative type of joint pathology. Second:

An appreciation of the mechanical factors involved in the chronic arthritic joint is of prime importance in the rehabilitation of this type of patient. Third: While conservative measures may prevent and alleviate many of the lesser contractures, there are many open surgical procedures available and useful in restoring these impaired joints to greater usefulness.

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Venereal Disease Control*

I. General Aspects of the Problem

By C. J. BUCKLEY, COMM., M.C., U.S.N.R.
Venereal Disease Control Officer, 4th ND

VENEREAL disease control and problems relating thereto in Philadelphia differ very little from those found in other communities in the United States.

That venereal diseases involve the basic impulses and proclivities of mankind, and that the medical elements of the problem are inextricably bound up with our social, religious, moral and political mores, no one scarcely need deny.

There is sufficient evidence accumulated from which we may learn that we must treat the social and moral ills as well as the medical conditions from a point of view that takes into consideration the individual, his needs and his problems.

We might, for a moment, consider some aspects of the current situation, especially as we in the Navy see it. "A most fundamental change[1] in the total venereal picture has been occurring during the past 12 to 18 months. That is, the trend from 'commercial house' prostitution to a sexual pattern of a more informal, clandestine, and less mercenary character.

"As Stokes and others have pointed out, the new type is the young girl in her late teens and early twenties, the young woman in every field of life who is determined to have one fling or better.

"For some time, evidence of this shift has been under the scrutiny of those of us who are in the Navy through the medium of an exposure and contact survey. Based on a rough analysis of the first 1800 cases reported from nine Naval Districts, it is found that pick-ups account for 64 percent of all contacts, and prostitutes for 21 percent. This analysis can by no means be interpreted as negating or refuting the united policy of repression of prostitution. On the contrary, it proves that this policy has been successful.

"Venereal contact reports come from nearly every city, town, hamlet and rural farm district in the United States. *So it is obvious that venereal disease control is a matter of national scope.* Its battles must be fought in the individual communities of the nation. Its battles must also be fought in the minds and bodies of individual persons. If we are to be successful in the prevention of venereal disease, we must recognize clearly that we must enlist the whole-hearted support and understanding—emotionally as well as intellectually—of the persons with whom we deal.

"We must concern ourselves with the application of education in its broadest reaches, and to a variety of groups. These include the personnel of the armed force, the adolescents, and the children."

Should the Navy be concerned with other than its own men? Yes, as a matter of fact, just as the total venereal disease situation in the Navy is a function, in a manner of speaking, of the civil community's control effort, so the efficiency of the Navy's educational program is related to that in the civilian population.

The technique of education commonly in use needs no elaboration here. We must always bear in mind the persons with whom we deal. It does not do, for instance, to assume that, because a man or woman is in the armed service, we, by order, can create new habits. For, at the crucial moment, when a decision must be made by that individual relative to exposure or not, prophylaxis or not, the danger of disease—and so on—he is not under the direct disciplinary influence of the military organization. What counts then is not only what we have taught him, but how we have taught him.

It is felt by the writer that too much preaching, too much teaching, too much showing of motion pictures, too much regimenting of a sailor so that when on liberty or shore leave, all his recreation is

* Commander Buckley's paper (I) and that of Dr. Ingraham (II) were read by the authors at the meeting of the College's Section on Public Health, Preventive and Industrial Medicine, April 5, 1943.

[1] Commander F. J. Carter (MC), U.S. Navy—New Patterns in Venereal Disease Control, As Seen By the Navy Medical Officer. Journal of Social Hygiene, Vol. 29, No. 4, April, 1943.

more or less supervised, and to the same groups over a period of weeks and months, may have distinctly deleterious results. In this Naval District, we endeavor not to make a sailor feel that he is a little boy all the time.

It seems to me as the picture of venereal disease control covering the past year unfolds before us the three most important problems are as follows:

First there is the "girl" problem. This problem is partly due to the successs of the prostitution repression effort and the tremendous changes going on in today's world. A few paragraphs of warning from Richard H. Anthony of the Massachusetts Society for Social Hygiene[2] would not be amiss before proceeding with this problem:

"We shall do better in our search for a valid relationship between war conditions and promiscuity and vice if we forget abstractions and translate these labels into terms of people. It is men and women who produce promiscuity and vice; let us see what the war has done to the people.

"The most obvious change the war has wrought is the creation of hordes of soldiers and sailors. Now, what is a soldier or sailor? The answer is simple enough. He is a man in a uniform and the emphasis in the definition is that he is a man.

"Before he joined the armed forces, he was a man, with all the sexual desires and impulses that have created problems since the world began. He is still a man and he is in uniform and so, with his fellows more conspicuous than before. If he misbehaves, the public says he is a soldier or sailor misbehaving, not a man misbehaving.

"This is admittedly elemental, but important. Half the wrong thinking about the soldier and girl problem proceeds from the erroneous premise that in his transformation from civilian to soldier (or sailor) he has become a robot who, if you show him a ping-pong table, or baseball diamond, will forget all about love. The 20 to 30 year old soldier has come into the Army with his patterns and codes of conduct pretty well established. If he has been sexually promiscuous beforehand, you can expect him to be promiscuous as a soldier. If he practiced continence beforehand, he may very well continue continent as a soldier.

"The problem, in essence, therefore, is not the soldier and girl problem, but the man and girl problem which we have had with us always. This does not simplify the problem any, but it saves us from the errors that would engulf us if we sought to blame the Army and Navy for the promptings of nature." Thus has the problem been summarized by Mr. Anthony.

Commercialized prostitution per se has been overtaken and engulfed by a surge of "amateur" sources of infection. Apparently it involves a large number of teen-age girls or "Victory" girls as classed in the South, whose objectives are not mercenary but even possibly—according to their lights—patriotic.

As our "Victory" girls, so to speak, are going to town there is an ever increasing wave of gonorrhoea being spread about. The incidence rate of syphilis infection is very low compared to gonorrhoea.

I would like to quote briefly from a recent paper[3] by Admiral Stephenson, Lieutenants Mast and Reynolds:

"There is one phase of the gonorrhoea problem which should be mentioned and that is the laissez-faire policy of neglect which so long has prevented progress in gonorrhoea control. Nowhere is this more true than in the important case finding procedure of contact investigation.

"From the epidemiologic point of view, gonorrhoea is really two diseases rather than one. Often the paucity and mildness of symptoms in the female so masks the disease that by the time infection is obvious, investigation of her sexual contacts is useless. However, given acute gonorrhoeal urethritis in the male, contact investigation is not only feasible but eminently desirable.

"It is clear then that adequate control of venereal disease (and at the present time in the Navy about 80% is gonorrhoea) requires the cooperation of every State, indeed of every Municipality, upon whose streets the uniforms of the Army and Navy may be seen. This is a national problem, and one which will require a nation-wide effort to solve."

All the facts are not in, by far, and the details of so vast a problem are so great that it is scarcely possible or proper for a Naval medical officer to outline a plan of solution. That there is a lack of education somewhere along the line is

[2] Anthony, Richard H. The Girl and the Man in the Uniform. Massachusetts Society for Social Hygiene, Boston, 1942.

[3] Stephenson, C. S., Mast, G. W., and Reynolds, F. W. (Session IV, Conference on Venereal Disease Control Needs in Wartime, of the U. S. Public Health Service), October, 1942.

obvious, however. There is a lack of appreciation by mothers and fathers of 'teen age girls, by fully mature women, and by men in civilian life, of the real and definite sabotage that venereal disease inflicts on the war effort.

The continuing of repressive activities against prostitution should not be relaxed, and the carrying through of further enforcement and guidance efforts with respect to the so-called "amateur" and "pick-up". There is need for fundamental education for these young people and for the persons who, knowingly or not, facilitate the spread of infection.

Second of the major community problems revolves around the need for basic information in matters pertaining to venereal disease. This should embrace at least an elementary knowledge of those signs and symptoms indicative of a venereal disease. There is no need to belabor the point. The need and effectiveness of an alert, informed public opinion is universally recognized. Less lip-service and more realistic action is required. Education, if thorough, and not the type which just scratches the surface, is the most potent offensive weapon at our command in preventing venereal disease and in mitigating the effects of indiscriminate exposure.

Third is "sex education". Whatever its name, it encompasses a vast field of possibilities which bear directly on our current problems and will influence the shape of things to come.

Mrs. Francis Bruce Strain recently pointed out that[4], "In wartime, we recognize the tempo and standards of life change. Boys and girls become men and women over night. The urgency of the hour accelerates their powers—all their powers, mental, physical, sexual.

"There is an answer to a young man, to his young lady, and to all boys and girls responding to the mating call as they are responding to the call to service. The answer is guidance—guidance and education in human relationships, in the principles underlying sex attraction, in knowledge of human procreation and family life. The kind of education and guidance they will welcome and take to their hearts."

There is plenty of food for thought in these brief sentences. The tasks of venereal disease control in the Army and Navy would be easier, and in all probability our striking power would be greater today if a widespread and efficient effort at organized "sex education" had been in effect many years ago.

We, in the armed services are not called upon today to decide whether or not there shall be "sex education" for this has always been in existence in some form or another. Rather, it is our task to channelize native interest, provide accurate and appropriate information, and to relate our efforts to life, not as lived in the past, but as it is lived today.

[4] Strain, Francis Bruce, Mrs. The Normal Girl in Abnormal Times. Proceedings of First Regional Conference on Social Protection, Chicago, December, 1942.

Venereal Disease Control

II. The Venereal Disease Control Program in Philadelphia

By NORMAN R. INGRAHAM, Jr., M.D.
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IT IS a suitable introduction, I believe, to a brief discussion of accomplishments of the Philadelphia Venereal Disease Control Program to date, to remark upon and to endeavor to clarify, two misinterpretations of statistical data which have caused much discussion, in the last several months. The first of these statements has to do with the high rate of syphilis among selectees and volunteers from Philadelphia; the second with the purported rapid increase in the incidence of syphilis and gonorrhea in Philadelphia since the commencement of the war. Both of these statements have been widely misunderstood, and have been the basis for remarks and publications which are far from being statistically or actually correct.

The origin of the information which has been so widely quoted, concerning the rates among selectees and volunteers, is to be found in an article which appeared in the October 18, 1941 issue of the *Journal of the American Medical Association*. I quote: "Philadelphia, with a rate of 41.7 per thousand, has the highest rate among the cities of 1,000,000 population or more.... It is interesting to note that the rate for cities of 1,000,000 and over reflect the intensity of the campaign against syphilis which has been waged in those communities."

It is only fair to point out that well-founded comparisons of this sort are possible only after careful consideration of standard errors and variances, and that even then the figures are no actual reflection of the true community rates unless they are corrected, in particular in the present instance for race and age. Only now, after many more months of study, are we beginning to obtain from the selective service, data which may be so corrected and so compared. This was taken into account in the subsequent publication of Vonderlehr and Usilton, *J. A. M. A.* **120**: 1369, (Dec. 26) 1942. Figures supplied to me upon request since that date, by the United States Public Health Service, from data from 2,000,000 selectees and volunteers through August 1941, for 14 of the largest cities in the Country, show that Philadelphia, with a rate of 8.5 per 1000 among its white selectees and volunteers, has the lowest rate in the Country of any City of comparable size, except Milwaukee, and with a rate of 182.2 per 1000 among its negro selectees, is eighth from the top; San Francisco,[1] Chicago,[1] St. Louis,[1] Los Angeles, Washington, D. C., Buffalo[1] and Baltimore, all having higher rates. Even these figures must be subject to careful additional analysis before they can be accepted as representing the true civilian picture for the age group in question, but there is every indication that Philadelphia, far from having the highest, may have one of the lowest syphilis rates of the larger cities in the Country. It may suggest, moreover, that the persistent efforts of the medical societies and of certain individuals and groups well known to most of you, over a period of many years dating back at least to the Philadelphia survey of 1929, though little publicized, may have had as profound results in the control of the venereal diseases as have had more spectacular and more publicized recent programs elsewhere.

Now the second question: The purported increase in venereal disease in Philadelphia since the commencement of the war. This is based, not on any knowledge of the true civilian incidence of gonorrhea and syphilis, but upon the reports of alleged sources of infection attributed by the military to Philadelphia. Briefly, the facts are these: In the early part of 1941, an average of no more than ten reports per month were received by the Health Department from all military sources. By the latter part of 1941, these averaged about forty per month, a four-fold increase during

[1] Not statistically significant for purposes of comparison.

the year. In the early months of 1942 it had increased to 80 per month, and in October, 1942, reached a peak of 215 for the single month, another 400 percent increase. Since October, 1942, there has been a consistent decrease noted in military reports from all sources: October, 215; November, 151; December, 183; January, 189; February, 135; March, 163.

Now I presume it is obvious to all of you that this does not represent an increase of several hundred percent in the civilian venereal disease rates, but that it is a reflection primarily, first of a tremendous increase in the number of men in uniform, and secondly of the development in both the Army and the Navy of a highly efficient group of specialists who immediately detect and report to the civilian health departments every case of venereal disease and the alleged source of infection or contacts. This is the type of cooperation that civilian venereal disease control officers have dreamed of for years, but lacking military discipline have never found it possible to put in effect on any wide scale.

I do not mean to imply that this increase in sources of infection reported by the military in Philadelphia is not a serious problem. Philadelphia is responsible for about 40% of all the sources of infection in the Third Service Command, and a very considerable proportion of the cases reported to the Fourth Naval District. But I do want to put these figures in proper perspective. We are here witnessing, not an actual increase in venereal disease, but a clearer definition than has ever been possible before, of a problem which has been with us for years and years, though never so fully realized. This is a situation which is not peculiar to Philadelphia. It is met with in many localities throughout the Country. In fact, it is almost universal.

You may ask me then, is there then an increase in the civilian rates for syphilis or gonorrhea? It is not possible to answer this question for Philadelphia, and I doubt very much that it is possible to answer it with anything approaching accuracy for any City. The Health Department deals with case reports, with the number of patients receiving treatment. We are just beginning to learn that hardly one-fourth of the people with syphilis in the community are receiving essential medical care, and that a much smaller, though less clearly defined percentage of individuals with gonorrhea, ever apply to a physician or clinic for treatment. When I state, therefore, that something less than 10,000 patients were treated for syphilis in Philadelphia in 1941, and that more than 15,000 (a 50% increase) received treatment in 1942, this is no indication of an increase of either the incidence or prevalence of syphilis in the community. I believe it is a credit to our case finding mechanism, however, and to the fuller utilization of our treatment resources.

In initiating, or perhaps I should say in continuing the venereal disease control program in Philadelphia, we have spent a great deal of effort in defining our problem, as has been seen, and even then the definition is only a partial one, particularly when we are concerned with gonorrhea.

The report of the committee which I was privileged to make before the Scientific Session of the Philadelphia County Medical Society in February of 1942, showed that there was in that period, an average of 9,146 patients with syphilis being treated in Philadelphia at any one time, and 1,521 patients with gonorrhea; and, moreover, that the total community *treatment* incidence rates of these diseases was for syphilis 7,680 and for gonorrhea, 7,284.

Now, if I could indulge for a moment in a little speculation, on the basis of the information which has been made available through the fact that the country is at war—the selective service figures, the military reports, corrected for race—there should be between 65,000 and 75,000 patients receiving medical care for syphilis in Philadelphia at the present time. It is true, that this figure is not corrected for age, but I call attention to the facts (1) that these figures are based on rates with the younger age groups; (2) that syphilis is a disease of which the prevalence increases in the older age groups; (3) that it was the experience of Vonderlehr and Usilton in correcting the figures from 45 States for age, "There was only one instance in which the correction produced a reduction in rate." This figure, then, (65,000 to 75,000 cases of syphilis which should be under treatment), is, if anything, an underestimate of the problem. Follow up studies of selective service cases have shown that approximately $\frac{1}{6}$ of these are in the potentially infectious stage of their disease.

I have only one method which seems as though it may have some basis in fact of even approaching the problem of the true incidence of gonorrhea in

the community, and this is through the military reports. Consistently, month after month, for every case of syphilis which is acquired by a soldier or sailor in Philadelphia, nine cases of gonorrhea are acquired. This might suggest that the true prevalence of active gonorrhea approaches nine times that of infectious syphilis.

The development of specific aspects of our program have been along the lines suggested in "Recommendations for Improvement of the Venereal Disease Control in Philadelphia" prepared by the joint committee of the Philadelphia County Medical Society, the Philadelphia Department of Public Health, the Pennsylvania State Department of Health and the United States Public Health Service and reported in February 1942. I will indicate what has been accomplished in the last year under each of the headings recommended by the committee:

I. INCREASED PUBLIC EXPENDITURES

Public expenditures in Philadelphia in venereal disease control have been increased from *$89,595* at the time the 1942 report was made, to the present figure of *$154,437*. This is still considerably below the *ten cents* per capita estimate made by the committee, but represents a very considerable increase over the previous year. At present these funds are allocated as follows: $54,190 local, $83,727 Federal-State, $16,520 direct Federal.

II. COORDINATED LOCAL ADMINISTRATION

By Resolution of October 1, 1942, of City Council and subsequent Ordinances, the administration of all of the funds coming into the Philadelphia Venereal Disease Control Program was centered in the Philadelphia Department of Public Health instead of partially in the State and partially in the local Department of Health, as was the case a year ago.

III. INCREASED ATTENTION TO CASE FINDING

(a) *Public education.* Starting with January 1, 1943, we have two full time lay educators assigned to the Division of Venereal Disease Control. This year has marked, for the first time, so extensive a series of radio programs over all of the larger stations. It has resulted in extensive newspaper publicity, not without some setbacks, however. It has resulted in the use of car cards for venereal disease for the first time by the Philadelphia Transportation Company in May, 1942. The Social Hygiene Day program on February 2nd, conducted by the Philadelphia Committee on Social Hygiene, at the Ritz Carlton, was the most successful ever staged. Several hundred individuals were, unfortunately, turned away because of lack of space. Since that time, the education office has received so many requests for conferences and speakers that it has not been nearly able to supply the demand. There is a greatly increased public awareness and interest in venereal disease control problems.

(b) *Serologic testing for syphilis.* The laboratories are working at capacity performing blood serologic tests for syphilis. Most of this work at the present time is occasioned by selective service, so that there has been little opportunity to make any considerable inroads on the vast industrial problem. To date selective service blood tests have brought to light *3371* cases of syphilis in Philadelphia, only 29% of which were receiving treatment for this disease. Twenty-seven percent of those in need of treatment were returned to private medical care, the remainder to part pay or public treatment facilities. Considering the great mass of hidden syphilis in the community, there is still a great need for expanded testing facilities in other fields than selective service, particularly in the industries.

(c) *Epidemiology.* Considerable attention has been directed toward contact tracing, particularly in the public clinics. Staff for this purpose was almost totally lacking a year ago, but now numbers ten public health nurses, a medical social worker, and ten under-follow-up workers. Lack of trained personnel and the difficulty in obtaining professional personnel because of the war conditions, has led us to experiment with the type of lay investigators which have proved so successful in other sections of the Country, particularly in California. We have also been most successful in developing close cooperative working relationships with the plain clothed police (Vice Squad), the Crime Prevention Unit (Police Women) and the Philadelphia Visiting Nurse Association. We have representation routinely at the hearings of the Women's & Men's Misdemeanants' Division of the Municipal Court and send a medical consultant regularly to the House of Correction.

IV. DEVELOPMENT OF TREATMENT FACILITIES

In addition to directing patients to private medical practice whenever possible, the develop-

ment of treatment facilities has largely centered about expanding the staff and hours of operation of already existing centers, rather than in the creation of new centers. Although the original survey, conducted two years ago, showed that 58% of all patients receiving treatment for syphilis and gonorrhea had incomes of less than $1,000 a year and could, therefore, not afford the full cost of medical care, change in the economic condition of many of these individuals indicate that more are now able to pay for this treatment. Active effort has been made by the Health Department in several directions to return these patients to private medical practice; or in the lower income groups, to pay clinics operated at hours convenient to the working patient. Concrete examples of the operation of this policy are shown (1) in the cooperative effort of the Philadelphia County Medical Society and the Philadelphia Department of Public Health in the compilation, publication and distribution of a list of more than 1,100 Philadelphia physicians capable of accepting additional venereal disease patients in their private practices; (2) the establishment of a rating system for all patients applying for treatment at the free public health clinics, something which had never been possible prior to the increase in trained staff during the last year. Patients able to pay are directed away from the free clinics to the part-pay clinics or to private medical care; (3) the encouragement of night clinics (usual fee, $1 per treatment patient visit) for the low salaried worker. Five such clinics, not under the immediate jurisdiction of the Health Department, have been established in the last year; at least one such clinic is in operation every evening in the week, with the exception of Saturday and Sunday.

V. IMPROVED CASE HOLDING POWER—CONFIDENTIAL CENTRAL REGISTRY

The first stage in the inauguration of the *confidential Central Registry* has been completed, since October 1942, in that a card file of the some 15,000 patients under treatment in the community has been set up in the Health Department. This contains an active and an inactive division by name and by address of both known cases and suspects. Within the last week, the second stage in the operation of the Central Registry has been inaugurated: its active utilization by the search clerks and by the attendance follow-up staff.

In summary, I believe I can say that with the whole-hearted support of the professional groups, the social agencies, the City Council and the public, we have made some progress in all aspects of the program which the committee formulated a little more than a year ago. But now that the problem has been more clearly defined, I believe we are truly humbled by the colossal task that still remains before we can truthfully say the venereal diseases are controlled in Philadelphia.

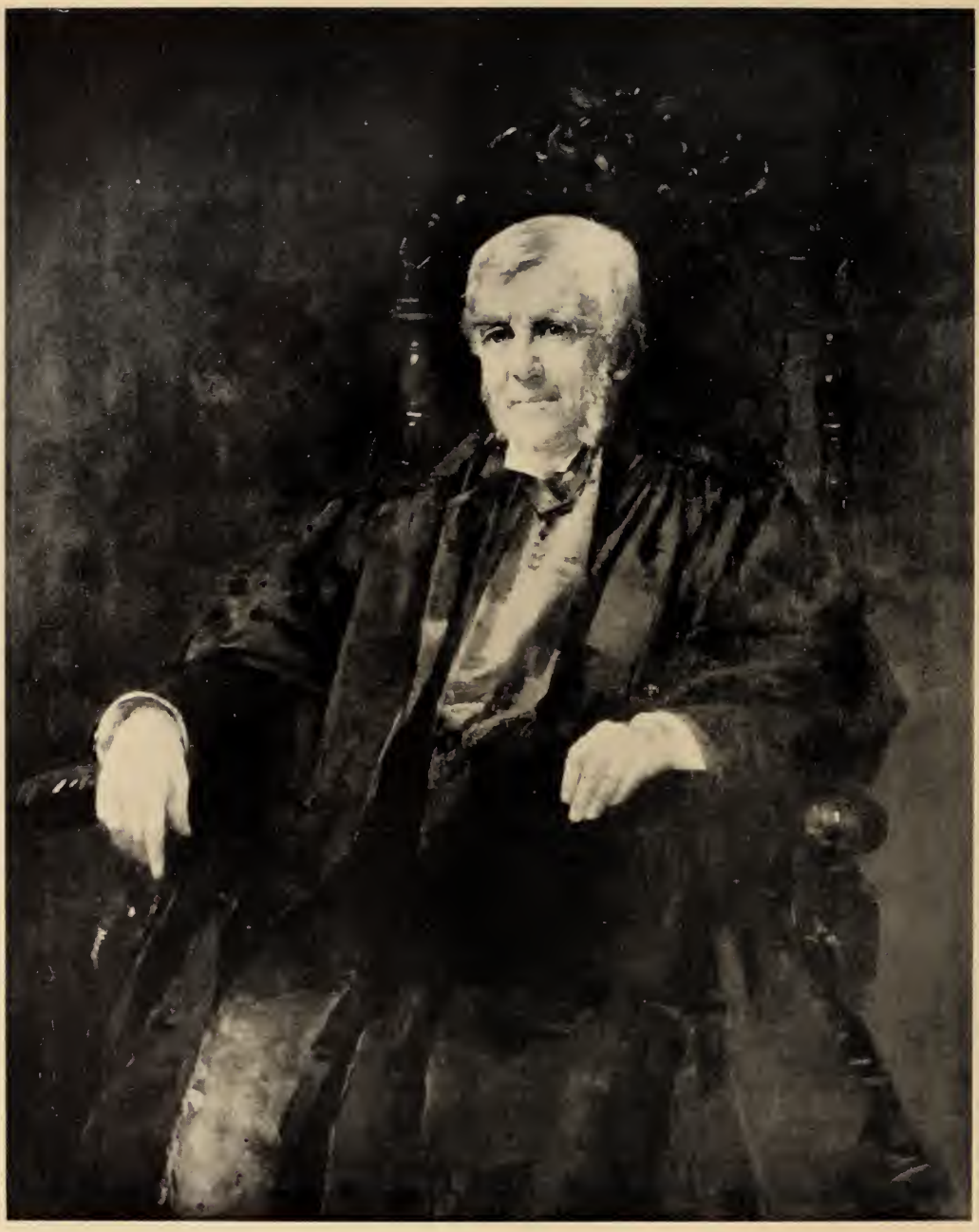

FIG. 1. The Sarah W. Whitman portrait of Oliver Wendell Holmes, painted in his eighty-third year (1892), at the time he became an Associate Fellow of the College of Physicians of Philadelphia. Photographed (1943) from the original in the possession of the College.

Oliver Wendell Holmes and The College of Physicians of Philadelphia*

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INTRODUCTION

THE least frequent of anniversary tributes paid the classics of fine letters and the sciences is, doubtless, the basic one of reading, or re-reading, them with the tranquil perspective that is one of the gifts of elapsed time. There are some good reasons, of course, why this is so. Those of us who have no, or insufficient, Italian, or Latin, or German, or French, must drink from the fountains of Dante, Vesalius, Goethe, Molière only after their pungent waters have suffered the chemistry of translation; in some cases, such as that of Vesalius, even that potion is denied us. Then, too, the *classic* classic seems to have a close affinity with length, breadth, and thickness—not altogether compatible with the complex pressures of our age. There might well be, also, the fear of discovery that the idol stands on feet of clay; for most of us are not iconoclasts. All in all, lip-service serves the status quo very well, holding back chaos and no more than gently retarding the process of enlightenment. Nevertheless, there is much to be said for the reading, or re-reading, of a classic, especially when it be brief, in our own language and sphere of special interest, and a ripe occasion presents itself.

This month (April) brings to us the centenary of one of the earlier American medical classics, Oliver Wendell Holmes' "The Contagiousness of Puerperal Fever". It is brief, in our own language and sphere of special interest, and it is easily accessible. Its hundreth birthday calls for some observance on the part of those of us left at home to mind the wigwams.

A reading of Holmes' essay, and a little study of the controversy it aroused, should be of particular interest to Fellows of this College. It is well known, of course, that the chief adversaries of Holmes' theory of infection were two of the leading American obstetricians of the day, Dr Hugh L. Hodge, Professor of Obstetrics at the University of Pennsylvania, and Dr Charles D. Meigs, Professor of Midwifery and the Diseases of Women and Children at Jefferson Medical College, both Fellows of this College and active in its affairs. Their antagonism, particularly that of Meigs, was so ill-considered and violent as to leave that page in the history of Philadelphia medicine one that we would willingly skip. But it is a page with a missing footnote, which this little communication is intended to provide. Holmes' controversy with Meigs and Hodge was not the beginning or the end of his relations with Philadelphia medicine.

* Read, in part, before the Obstetrical Society of Philadelphia, April 1, 1943.

I

"THE CONTAGIOUSNESS OF PUERPERAL FEVER" AND THE COLLEGE

At the stated meeting of this College on May 3, 1842—nine months before Holmes read his paper at a meeting of the Boston Society for Medical Improvement and eleven months before its appearance in the April, 1843, number of the *New England Quarterly Journal of Medicine and Surgery*—with Dr. J. C. Otto, vice president, in the chair, "Dr. Condie begged leave, as there appeared to be no other written communications to be presented, to call the attention of the College to a subject of very great interest to the medical profession, especially to those of its members engaged in obstetrical practice. He alluded, he remarked, to the prevalence, at the present time, of puerperal fever of a peculiarly insidious and malignant character."[1] Those present, as recorded in the minutes of the meeting, were in addition to Dr Otto: Drs Robert M. Huston, Thomas Steward-

[1] *Quarterly Summary of the Transactions of the College of Physicians of Philadelphia*, **1**, 50–51, 1846 (the first volume covers the transactions from November, 1841, to August, 1846, inclusive, and includes the numbers issued from February, 1842, to the fall of 1846).

son,[2] Isaac Parrish, Henry H. Smith, Joseph Carson, D. Francis Condie, William S. Zantzinger, Francis West, David Rutter, Joseph Warrington, William Ashmead, George W. Norris, Edward Peace, John Rodman Paul, and the secretary, Henry Bond. The obstetric elder statesmen, Drs Meigs and Hodge, evidently did not attend the meeting. In fact, it is rather remarkable, and possibly of some significance, that of those present only Dr Otto, the vice-president, Dr Bond, the secretary, and Dr Huston were Fellows of more than seven years standing. This was essentially a youngsters' meeting.

The minutes only briefly rehearse the course of the discussion on puerperal fever. Fortunately for the youthful and alert Dr Holmes, our *Transactions*, which had been in a state of suspended animation since 1793, in February of 1842 was revived as the *Quarterly Summary of the Transactions*, and in its third number, issued in July, there appeared a rather full account of the discussion, upon parts of which Holmes relied rather importantly a few months later to help support the thesis of his memorable paper.[3]

The account of the discussion on puerperal fever as printed in our *Quarterly Summary* is well worth reading for its descriptions of the appearance, course, incidence, and treatment of the disease, as well as for its vivid picture of a group of physicians striving to find the answer to a major medical problem of vital current interest while the answer wanders in and out of their discussions in the manner of a subordinate musical theme.

Holmes quotes from this account, as I have said, and, as there appears to be no subsequent reference to this contribution of the College, either in our records or elsewhere, it seems fitting to recall at this time, in a little fuller manner than Holmes presented them, the views as to the contagiousness of puerperal fever which are recorded in the report of the meeting.

"An important query presents itself, the Doctor [Condie] observed, in reference to the particular form of puerperal fever now prevalent. Is it, namely, capable of being propagated by contagion, and is a physician who has been in attendance upon a case of the disease, warranted in continuing, without interruption, his practice as an obstetrician? Dr. C., although not a believer in the contagious character of many of those affections generally supposed to be propagated in this manner, has nevertheless become convinced by the facts that have fallen under his notice, that the puerperal fever now prevailing, is capable of being communicated by contagion. How otherwise can be explained, the very curious circumstance of the disease, in one district, being exclusively confined to the practice of a single physician, a Fellow of this College, extensively engaged in obstetrical practice—while no instance of the disease has occurred in the patients under the care of another accoucheur practising within the same district; scarcely a female that has been delivered by this gentleman for weeks past has escaped an attack? Wishing to confine his remarks on the present occasion entirely to the facts that have fallen under his own observation since the occurrence of the disease in this vicinity, Dr. C. declined referring to the numerous facts upon record, in proof of the contagiousness of puerperal fever."[4]

After thus raising the question of the contagiousness of the disease, Dr Condie veered off to a discussion of treatment. Dr Huston then wanted to know whether the children of the females who had died of the disease were living—and if not, whether autopsies had been performed on them, the latter a point of interest to Dr Paul also. Dr Ashmead, who had made post mortem examinations (at one of which Dr Hodge was present) on the children who did not survive, reported on his findings. After further discussion by Drs Huston and Condie on matters unrelated to the question of contagion, Dr Ashmead rather abruptly[5] "remarked, that he did not coincide with some of the other Fellows who spoke this evening, as to the contagiousness of the complaint. He had heard of the appearance of the disease in Lower Dublin, and at Germantown, but it was by no

[2] See Holmes' references to Stewardson in his "Lines" (Section II) and in his letter to Gerhard (Section III, Letter 1), in the latter of which he misspells Stewardson's name, as he used to do in his letters from Paris (Morse's *Life*).

[3] *N. Engl. Q. J. Med. & Surg.*, **1**, 512–14, 1843; reprint of the same year, 10–13; "Puerperal fever, as a private pestilence" (1855), 36–39; etc.

[4] *Quarterly Summary*, **1**, 53. It is strange that Holmes does not quote this last sentence, as it reiterates his own contention that ample records were already in existence proving the contagiousness of the fever.

[5] The reporter may have interpolated Dr Ashmead's remarks at a point earlier in the discussion than they were made; only Dr Condie had discussed the question at this point, according to the summary of the discussion.

means general, nor did it invariably follow in the track of any physician.

"Dr. Condie replied, that there was a great difference between the facility with which contagion could be conveyed by a practitioner of midwifery, engaged in a large city practice, attending probably three or four cases of parturition daily, and within a very few hours of each other—and by an accoucheur in the country, whose annual practice would, perhaps, fall far short of that of one month of the former, and between whose cases, consequently, there elapsed often days or even weeks—thus, under ordinary circumstances, rendering it very difficult for him to communicate contagion from one of his patients to another. One fact would seem, however, to establish the eminently contagious or infectious character of the more virulent cases of puerperal fever, and which is, that where it occurs as an epidemic in the lying-in wards of an hospital, no other means have been found to prevent the spread of the disease among the inmates and check its further occurrence, except that of dispersing the patients and abandoning the wards. It has even happened that after the wards have been fully cleansed and ventilated, and remained vacant for some time, on their re-occupation the disease has broken out anew.

"Dr. Rutter observed, that after the occurrence of a number of cases of the disease in his practice, he had left the city and remained absent for a week, but on returning, no article of clothing he then wore having been used by him before, one of the very first cases of parturition he attended was followed by an attack of the fever, and terminated fatally—he cannot readily, therefore, believe in the transmission of the disease from female to female, by a contagion conveyed in the person or clothes of the physician."

Holmes laid considerable stress upon the succeeding remarks of Dr Warrington, which he summarized as follows: "Dr. Warrington stated, that a few days after assisting at an autopsy of puerperal peritonitis, in which he laded out the contents of the abdominal cavity with his hands, he was called upon to deliver three women in rapid succession. All of these women were attacked with different forms of what is commonly called puerperal fever. Soon after these he saw two other patients, both on the same day, with the same disease. Of these five patients two died."[6]

[6] Holmes' calculation was a bit hasty; three of the patients died.

Further evidence that the theory of contagion was constantly present in, if not yet wholly acceptable to, the minds of these physicians is afforded by the reporter's statement that, "in reference to the idea of the contagiousness of this disease . . . he [Dr Warrington] would state facts as they had occurred under his observations, but would advance no opinion;" and in his statement that "In three of the fatal cases, autopsies were made, at which Dr. Warrington was not present, from a fear that he might more readily communicate the disease, if he participated in them."

Holmes, finally, so far as he drew upon our *Quarterly Summary*, in part quoted, in part summarized the following significant passage from our reporter's account of this meeting:

"Dr. West stated, that some facts, in proof of the contagiousness of puerperal fever had been related to him by Dr. Jackson,[7] of this city, formerly of Northumberland, and a Fellow of this College, who he regretted was absent this evening.

"Whilst practising in Northumberland county, seven females delivered by Dr. Jackson in rapid succession, were all attacked with puerperal fever. The first and fourth of these cases were freely bled and purged, and recovered, the others terminated fatally.

" 'Women', the doctor remarked, 'who had expected me to attend upon them, now becoming alarmed, removed out of my reach, and others sent for a physician residing several miles distant. These women, as well as those attended by midwives, all did well; nor did we hear of any deaths in child-bed within a radius of fifty miles, excepting two, and those I afterwards ascertained to have been caused by other diseases. I now began to be seriously alarmed on the score of contagion. Although I had used some personal precautions before, I now feared that they had not been sufficient.

" 'To the next case of parturition, then, I did not go without, as was supposed, a thorough purification. This woman was attacked with the disease and died, I then recollected that I had worn to her house the same gloves, lined with flannel, which I had worn through all my previous attendance. I do not pretend to say that this was

[7] This Dr Samuel Jackson is usually characterized by some such phrase as "late of Northumberland," presumably to distinguish him from his more eminent contemporary Professor Samuel Jackson.

the source of the contagion in this case. I merely state the fact.

" 'During the next two months, I attended several obstetrical patients, who all did well; and then I was again horrified with a decisive and violent case of the fever. The patient recovered under the most vigorous depletion of bleeding, puking, sweating, and purging. A ninth case soon after occurred, and was cured by the same means.

" 'No contagion, it is certain, could have reached these last two cases, unless through the medium of injection pipes and bladders, which had been used by them a day or two after delivery, and which I found were the very instruments that had been used in two of my former cases, and then put away, probably without any purification.

" 'It may be worthy of remark, that the house in which the first case of the disease occurred, was filthy almost beyond comparison; add to which, I was attending and dressing a limb extensively mortified from erysipelas, and went immediately to the accouchement with my clothes and the unfortunate gloves most thoroughly imbued with the effluvia of that sphacelation . . .' "[8]

Dr Stewardson then described an "endemic" of puerperal fever in the lying-in ward at the Pennsylvania Hospital, in 1830. "Nothing arrested the progress of the disease, but the entire evacuation of the wards, and closing them against farther admissions. . .

"In the following year, the wards were re-opened, soon after which, three cases of the disease occurred in rapid succession. . .

"During Dr. Smith's residence in the Pennsylvania Hospital, in the years 1837 and 38", our account of the discussion concludes, "erysipelas made its appearance in the surgical wards; and although every means were employed to prevent it, two cases of puerperal peritonitis appeared in the lying-in ward. . ."

Despite the extra-mural controversy that Holmes' paper aroused and the unsettled status of the question until Semmelweis eighteen years later proved conclusively the validity of the theory, the College never again officially considered the subject. Puerperal fever is mentioned once or twice in the reports printed in the *Transactions*, but chiefly in connection with its relationship to typhus fever and erysipelas. Indeed, the only reference in the *Transactions* to the Holmes paper occurs in Dr Jackson's "Annual Report on the Theory and Practice of Medicine" (read October 3, 1843), in which he has a good deal of acrid comment on the typhus-puerperal fever question. He says:

"In the Amer. Journal of the Med. Sciences for July, 1843, there are some cases related from the New England Quarterly, which cases are adduced to prove the contagiousness of this disease; but as the doctrine of typhus is happily not there maintained, they do not come within the scope of the present report."[9]

Had Drs Meigs and Hodge, who between them constituted the College's Committee (of one) on Midwifery from 1840 to 1844, produced the annual reports expected of them, references to the theory of contagion and to Holmes' paper would doubtless have been more numerous and this communication have had a less amiable story to tell. As it is, one may safely draw the conclusion that the Fellows, sorely perplexed by the epidemic, were fully alive to the various theories concerning the transmission of the disease. If they were not at the time unanimously convinced of the validity of the contagion theory, even after the appeance of Holmes' paper, in which their own discussion was used in support of it, they were aware of the theory and, in the instances of Drs Condie, Jackson, and Warrington, at least, obviously deeply impressed by it.

"The progress [of medicine]", says that philosophical, perceptive, and altogether remarkable quondam country doctor, Dr Samuel Jackson, "late of Northumberland", in one of his annual reports on the theory and practice of medicine, "the progress is ultimately sure, though sometimes almost imperceptibly slow, and even affected by temporary retrogradations. Our science is the rock of health in the voyage of life. As the most skilful mariners are occasionally driven from their course by counter currents and contrary winds, so is the voyage of science sometimes delayed by the currents and winds of popular prejudice, presumption, and interference, as also by a thousand latent dangers, one of which has long been the allurements of that very theory in medicine our appointment requires us to notice."[10]

As regards the historical place of Holmes' paper, has not the author himself stated the case in such a way as to leave no occasion for further dispute or attempt to define it?:

[8] *Quarterly Summary*, **1**, 60.

[9] *Ibid.*, 177.

[10] *Ibid.*, 63.

"I do not know what others have done since my efforts; I do know that others had cried out with all their might against the terrible evil, before I did, and I gave them full credit for it. But I think I shouted my warning louder and longer than any of them, and I am pleased to remember that I took my ground on the existing evidence before the little army of microbes was marched up to support my position."[11]

The Fellows of the College should know that in their library is a copy of the exceptionally rare reprint of Holmes' paper—"presented by the author".

AN ACCESSORY NOTE ON THE HOLMES PAPER

Some medical historians have done injustice to Holmes by declaring that the American exhibited only a cursory acquaintance with the work of Semmelweis and referred to him as "one 'Senderein' " or 'Semmeliveis'. As Semmelweis' first pronouncement was not published until some five years after the original publication of Holmes' paper, it is obvious that the latter could not have contained any reference to Semmelweis at all. When Holmes re-published the paper, in 1855, six years before Semmelweis' definitive publication, he did so "without the change of a word or a syllable", but with a lengthy introduction and a list of "Additional References and Cases". Semmelweis is not referred to in the introduction. Holmes' only mention of him occurs in the following "additional reference":

"Arneth.—Paper read before the National Academy of Medicine. Annales d'Hygiène, tome lxv. 2e Partie. (Means of Disinfection proposed by M. 'Semmeliveis' (Semmelweiss). Lotions of chloride of lime and use of nail-brush before admission to lying-in wards. Alleged sudden and great decrease of mortality from puerperal fever. Cause of disease attributed to inoculation with cadaveric matters.) See also *Routh's* paper, mentioned above."[12]

Though, doubtless through a printing error, the volume number of the *Annales* is incorrectly given as lxv, instead of xlv, Holmes has obviously recognized the incorrect spelling 'Semmeliveis' and attempted to correct it, falling, however, into the common error of endowing the name with an additional final 's'. The variation 'Senderein' appears nowhere in Holmes' paper.

Holmes' readers are referred for the Routh paper to "Proc. of Royal Med. Chir. Soc., Am. Jour. Med. Sc., April, 1849, also in B. and F. Med. Chir. Review, April, 1850." The proceedings of the Royal Medical and Chirurgical Society first appeared in the *London Medical Gazette*, and were reprinted in the *American Journal of the Medical Sciences*, which therefore furnished Holmes with his introduction to Semmelweis' work. In Routh's paper, Semmelweis' name is spelled with one 'm' and two 's' 's at the end. Thus, judging from his references, Holmes had no authority for the spelling he adopted.

It is thus doubtless true that, as is so often charged, Holmes knew of Semmelweis' work only at second-hand; but the latter's classic monograph was not published until 1861, and it is not likely that the then-recently-founded *Zeitschrift* of the Royal Society of Physicians of Vienna, in which Semmelweis' anticipatory paper appeared (1848–9), had a very lively circulation in the United States, if any at all. Under such circumstances, this criticism seems to have little point. What may be thought his failure to evaluate properly Semmelweis' findings may also be viewed from the standpoint of the person adding to his artillery one more machine on behalf of a cause of the righteousness of which he is already firmly convinced.

II

HOLMES PORTRAIT; POEM. HOLMES AN ASSOCIATE FELLOW

There is scattered evidence that Oliver Wendell Holmes maintained contact with members of the medical profession in Philadelphia from his salad days in Paris until his death. The first of the letters printed farther on in this communication was written in 1839, three years after Holmes' return from his European studies. The purpose of this section is to recall events near the close of his life which, like the event recorded in the first section, link in perpetuity his name with the history of the College.

The cultural affinity between Boston and Philadelphia has perhaps never been more strikingly demonstrated than by the careers of Philadelphia's S. Weir Mitchell and Boston's Oliver Wendell

[11] Quoted from Hayakawa, S. I., and Jones, H. M., *eds.* Oliver Wendell Holmes . . .New York: American Book Co.: cop. 1939. P. xxxiii; also quoted by Osler, *An Alabama Student, and other Biographical Essays*, 1908, 66.

[12] *Puerperal Fever, as a Private Pestilence*, 1855, 59.

Holmes, two physicians who were, at the same time, among the best known American men of letters of the 19th century. Mitchell's acquaintanceship with Holmes dated back to the youth of the former, when Holmes was often a guest in the Mitchell household. The life-long friendship between the two men is attested by the letters published in the biographies of each.

When, at its meeting on April 6, 1892, the College carried a motion of Dr Cleeman, chairman of the Committee on Entertainment, "that the College have a dinner for itself and guests on the evening of Saturday April 30th," it may have meant merely that spring was in the air. However, the dinner turned out to be one of the most notable affairs in the annals of the College, receiving columns of attention in the local press. The dinner was held in the Hall of the College, then located at 13th and Locust Sts., with nearly 175 in attendance. At the speaker's table, with the president, Dr S. Weir Mitchell, were Drs Pepper, J. M. Da Costa, Wood, Osler, William H. Welch, Holland, Cleeman, Starr, J. Madison Taylor, and Mr Talcott Williams. Two of the others noted as being present were Drs Charles W. Burr, now our distinguished Honorary Librarian, and S. Solis Cohen, happily also still on the roll of "Resident Fellows".

That the College had itself a dinner indeed is well evidenced by the menu here reproduced (Fig. 3). Following it, the Loving Cup was passed

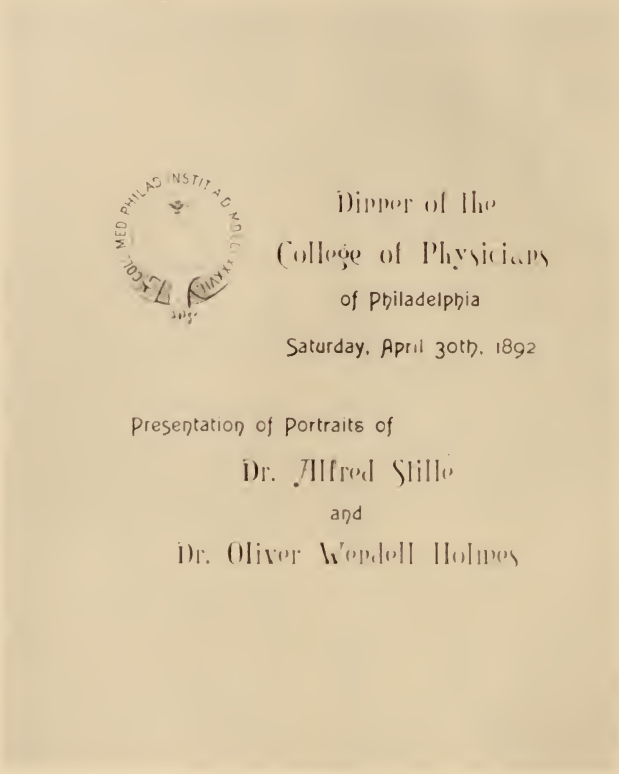


Fig. 2

around,[13] in tribute to D. Hayes Agnew, former president, who had recently died, and the formal program begun. Dr Holland gave an historical sketch of the College and was followed by Dr Horatio C. Wood, who presented, on behalf of the medical profession, Sarah W. Whitman's oil por-

[13] The ceremony of the Loving Cup persisted, in the College's social affairs, well into our present bacteriological era—in fact, it is only within the last decade that the cup was quietly retired to the status of an honored relic.

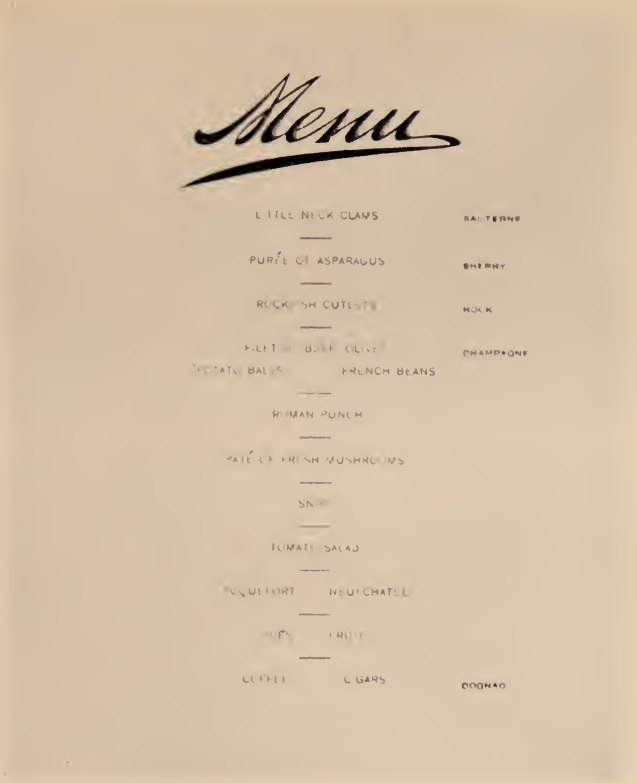



FIG. 3. The menu of the dinner held by the College of Physicians on the occasion of the presentation of the Whitman portrait of Holmes

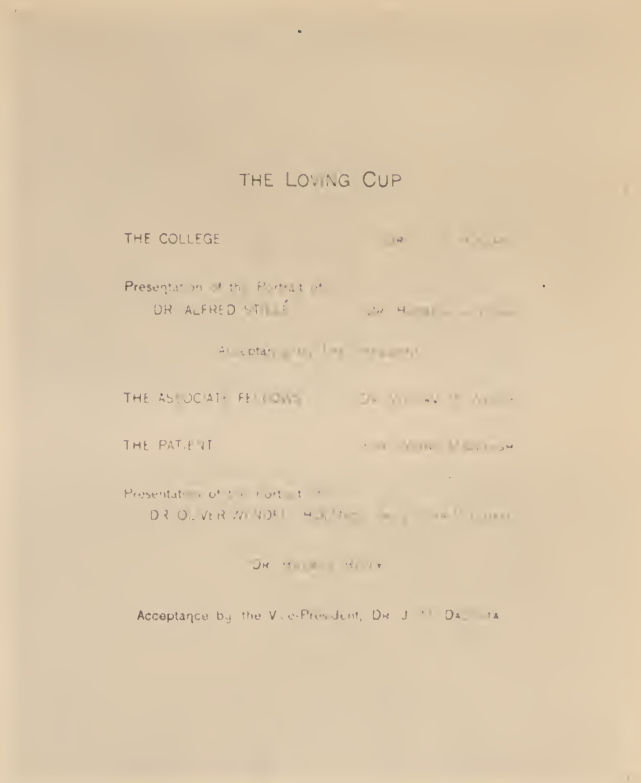


FIG. 4. The program following the dinner which served as the occasion for the presentation of the Holmes portrait

trait of Dr Alfred Stillé,[14] which now hangs in Mitchell Hall. The venerable former president, nearly eighty, was not present but, as the newspaper accounts tell us, his colleagues broke into spontaneous applause when his benign features were revealed. After this portrait had been accepted by the president, Dr William H. Welch,[15] of Baltimore, offered a toast on behalf of the Associate Fellows, and Mr Talcott Williams, replacing the scheduled but absent Hon. Wayne MacVeagh, another toast, as spokesman for The Patient. Unfortunately, none of these addresses is to be found in our files. That is not the case, happily, with the literary productions that then had their début, and that are of chief interest to us now.

Dr Mitchell, ever ready, like Holmes himself, to burst into verse when an appropriate occasion presented itself, found one on this occasion. The verses with which he presented to the College Mrs. Whitman's portrait of Holmes were printed in the newspapers at the time, in an elegant, privately-printed little booklet, and in his *Collected Poems* (1896); but these are of varying accessibility, and the current observance certainly warrants the reprinting that follows:

VERSES READ ON THE PRESENTATION BY S. WEIR MITCHELL TO THE PHILADELPHIA COLLEGE OF PHYSICIANS OF SARAH W. WHITMAN'S PORTRAIT OF OLIVER WENDELL HOLMES, M.D.

We call them great who have the magic art
To summon tears and stir the human heart,
With fictive grief to bring the soul annoy,
And leave a dew-drop in the rose of joy.
A nobler purpose had the Masters wise
Who from your walls look down with kindly eyes.
Theirs the firm hand and theirs the ready brain
Strong for the battle with disease and pain.

Large were their lives: these scholars, gentle, brave,
Knew all of man from cradle unto grave.
What note of torment had they failed to hear?
All grief's stern gamut knew each pitying ear.
Nor theirs the useless sympathy that stands
Beside the suffering with defenceless hands;
Divinely wise, their pity had the art
To teach the brain the ardor of the heart.
These left a meaner for a nobler George;
These trod the red snows by the Valley Forge,
Saw the wild birth-throes of a nation's life,
The long-drawn misery and the doubtful strife:
Yea, and on darker fields they left their dead
Where grass-grown streets heard but the bearer's tread,
While the sad death-roll of those fatal days
Left small reward beyond the poor man's praise.

Lo! Shadowy greetings from each canvas come,
Lips seem to move now for a century dumb:
From tongues long hushed the sound of welcome falls,
"Place, place for Holmes upon these honored walls."
The lights are out, the festal flowers fade,
Our guests are gone, the great hall wrapped in shade.
Lone in the midst this silent picture stands,
Ringed with the learning of a score of lands.
From dusty tomes in many a tongue I hear
A gentle Babel,—"Welcome, Brother dear.
Yea, though Apollo won thy larger hours,
And stole our fruit, and only left us flowers,
The poet's rank thy title here completes—
Doctor and Poet,—so were Goldsmith,—Keats."
The voices failing murmur to an end
With "Welcome, Doctor, Scholar, Poet, Friend."

In elder days of quiet wiser folks,
When the great Hub had not so many spokes,
Two wandering gods, upon the Common, found
A weary schoolboy sleeping on the ground.
Swift to his brain their eager message went,
Swift to his heart each ardent claim was sent:
"Be mine," Minerva cried. "This tender hand
Skilled in the art of arts shall understand
With magic touch the demon pain to lay.
From skill to skill and on to clearer day
Far through the years shall fare that ample brain
To read the riddles of disease and pain."
"Nay, mine the boy," Apollo cried aloud,
"His the glad errand, beautiful and proud,

[14] Stillé was another of the Philadelphians who studied under Louis in Paris, but a few years later than Holmes, Stewardson, and Gerhard. The dual presentation of the portraits, by the same artist, of the octogenarian Holmes and the near-octogenarian Stillé had thus an artistic appropriateness that suggests the guiding hand of Dr Mitchell.

[15] Formalities must have been waived and at least theoretical chances taken, because the eminent Dr Welch had not at this time been elected an Associate Fellow, his election (along with Holmes') being scheduled for the stated meeting of the College on the following Thursday.

To wing the arrows of delightful mirth,
To slay with jests the sadder things of earth.
At his gay science melancholy dies,
At his clear laugh each morbid fancy flies.
Rich is the quiver I shall give his bow,
The eagle's pinion some bold shafts shall know;
Swift to its mark the angry arrow-song
Shall find the centre of a nation's wrong;
Or in a people's heart one tingling shot
Pleads not in vain against the war-ship's lot.
Yea, I will see that for a gentler flight
The dove's soft feathers send his darts aright
When smiles and pathos, kindly wedded, chant
The plaintive lay of that unmarried aunt;
Or sails his Nautilus the sea of time,
Blown by the breezes of immortal rhyme,
Or with a Godspeed from her poet's brain,
Sweet Clémence trips adown the Rue de Seine.
The humming-bird shall plume the quivering song,
Blithe, gay, and restless, never dull or long,
Where gayly passionate his soul is set
To sing the Katydid's supreme regret,
Or creaking jokes, through never-ending days,
Rolls the quaint story of the Deacon's chaise.
Away with tears! When this glad poet sings,
The angel Laughter spreads her broadest wings.
By land and sea where'er St. George's cross
And the starred banner in the breezes toss,
The merry music of his wholesome mirth
Sends rippling smiles around our English earth."

"Not mine," Minerva cried, "to spoil thy joy;
Divide the honors,—let us share the boy!"

Dr. Holmes, we know, was not present on this occasion, but he was apprized of it in advance and sent on the following poem in response, the holograph of which is now one of the College's treasured literary possessions[16]:

LINES BY OLIVER WENDELL HOLMES ON THE PRESENTATION OF HIS PORTRAIT TO THE PHILADELPHIA COLLEGE OF PHYSICIANS

"How came I here?" The portrait thus might speak,—
The crimson mantling in its canvas cheek,—
"Here in this concourse of the grave and wise
Who look upon me with inquiring eyes,
As on some homeless wanderer, caught astray?
An *error loci*, Boerhaave would say.
Is this great hive of industry my home?
Where is the Common? Where my gilded dome?
Where the Old South? The Frog pond? Most of all,
My sacred temple, Freedom's Faneuil Hall?

No answer comes; no trick of human art
Can force those fixed unmoving lips apart.
He whom the picture shadows must explain
This lawless inroad on a strange domain.
Were it *my* votive offering, meant to shew
My grateful sense of all the debts I owe
To your fair city, its unlooked for face
Might find no caviller to dispute its place.
Yet though the friendly offering is not mine
It bears my benediction to the shrine
Where if it meets a welcome, longer yet
Will stretch the column which displays my debt.

Friends of my earlier manhood, ever dear,
Whose lives, whose labors all were centered here
How bright each figure stands before me now
With eyes undimmed and fair unwrinkled brow,
As when, with life before us yet untried,
We walked the "Latin Quarter" side by side
Through halls of death, through palaces of pain
That cast their shadows on the turbid Seine.

When o'er our coffee, at the old "Procope",
Smiling we cast each other's horoscope,

[16] In addition to the original manuscript, the library of the College has two separate, 4-page leaflet printings of the Holmes' "Lines." The larger, on paper watermarked "Old Berkshire Mills 1890," gives the verses in their entirety, and it seems likely that Holmes had this leaflet printed in Boston for the occasion. The other is printed on inferior paper, and, presumably merely in order to confine the printing to the inside pages, 38 lines have been omitted, the lacunae being indicated by asterisks. This leaflet is undated, the date of the library stamp, Dec. 27, 1898, giving the only clue as to when it might have been printed. The "Lines," along with Mitchell's verses, were printed in the local newspaper accounts of the dinner. Mr. T. Franklin Currier, of the Harvard College Library, has kindly drawn my attention to the fact that both poems were also printed in the *Boston Medical and Surgical Journal* of May 5, 1892 (vol. 126, pp. 450–1). A preceding brief account of the dinner concludes: "We venture to think our readers will condone the substitution of unpublished poems by the Doctor-Poet of Philadelphia and the Poet-Doctor of Boston for the customary editorials." Mr. Currier states that the "Lines" appear also in G. B. Ives' *Holmes Bibliography* (1907). None of the nine or ten Philadelphia medical journals of the day printed the poems, and only one of them even mentions the affair. The "Lines" given here follow the manuscript, which differs in a few unimportant particulars from the edited, printed versions.

Daring the futures dubious path to scan,
Gerhard,[17] your Gerhard was the coming man.
Strong-brained, strong-willed, inquiring patient, wise,
He looked on truth through achromatic eyes;
Sure to succeed, for Nature, like a maid,
Loves best the lovers who are not afraid,
Lends them her hand to lead them where they please,
And trusts them boldly with her master-keys
Behold, unfading on the rolls of fame
Typhus and Typhoid stamped with Gerhard's name.

Look on the stately form at Gerhard's side
He too shall live to be his city's pride.
Tall, manly, quiet, grave, but not austere,
Not slow of wit, a little dull of ear,
Him we predestined to the place he won,—
Norris,[18] the Quaker city's noble son.
Armed with the skill that science renders sure
His look, his touch, were half his patients' cure;
What need his merits I should further tell?
His record stands; your pages know it well.
Still wandering, lonely, mid the funeral urns
To one loved name my saddening thought returns
Less to the many known, but to the few
A precious memory,—*Stewardson*,[19] to you.
Through many a league we two together fared,
The traveller's comforts and discomforts shared,
When hills and valleys parted distant towns,
Long ere the railway smoothed their ups and downs.
In all the trials wearying days could bring
No fretful utterance ever left its sting
Pity it was that, chased by pallid fears,
He walked in shadow through his morning years,
Talked of his early doom, and then, and then,
Lived on, and on, past three score years and ten.
Too shy, perhaps too timid for success
He fought life's battle bravely not the less,—
Others left prouder memories, none more dear,—
For those a sigh, for Stewardson a tear.

Well, years rolled on, we went our several ways
Not unrewarded with our meed of praise;
Time took the weight and measure of our brains
Set us our tasks and paid us for our pains
At length (our side-locks fast were turning gray)
He brought our art that all-important day
When here our Aesculapian Congress met
(Its second gathering, you will not forget.[20]
I with the crowd your far-famed city sought,
Pleased to behold the Schools where Rush had taught,
Where Wistar labored and where Horner led
His thirsting flock to Surgery's fountain-head.[21]

What kindly welcome with the rest I shared,—
A little pleased,—perhaps a little scared,
When Chapman[22] hugged me in his huge embrace
With praise that lit a bonfire in my face,—
When Francis,[23] guest at *Mitchell's*[24] generous board,
My humble name across the table roared,
Coupled with one which figures on the roll
Of England's poets,—bless his worthy soul!
Garth,—good Sir Samuel, whose poetic spark
Scarce seen by day, still glimmers in the dark.

These flitting phantoms of the past survive
While grateful Memory keeps her fires alive.
Friends of the days that fear and anguish knew
My heart records a deeper debt to you.

To this kind refuge, hallowed evermore,
Her shattered sufferers fond affection bore.
Full many a father tracked his bleeding son
Fresh from the murderous conflict, lost or won,

[17] William Wood Gerhard (1809–1872).
[18] George W. Norris (1808–1875).
[19] Thomas Stewardson (1807–1878). See footnote 2.

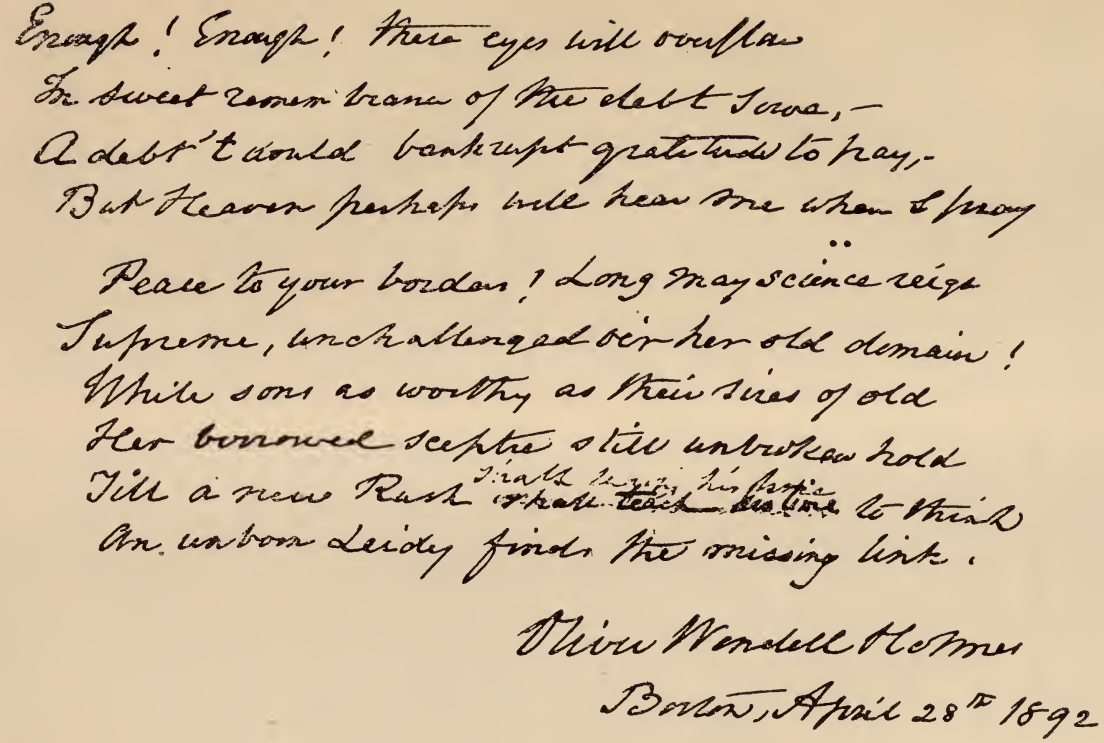
[20] The American Medical Association now regards this 1847 meeting in Philadelphia as its first annual session. The library owns the Registration Book of the meeting. Holmes, representing Harvard University, was the 189th delegate to register, giving his local address as the United States Hotel.

[21] Though William Edmonds Horner (1793–1853) practiced surgery at various times, he was professor of anatomy at the University and his reputation was gained in that field.

[22] Nathaniel Chapman (1780–1853) was the president of the Association.

[23] John W. Francis (1789–1861), of New York.

[24] John Kearsley Mitchell (1793–1858), father of Weir Mitchell.


Enough! Enough! These eyes will overflow
In sweet remembrance of the debt I owe,—
A debt 't would bankrupt gratitude to pay,—
But Heaven perhaps will hear me when I pray

Peace to your borders! Long may science reign
Supreme, unchallenged o'er her old domain!
While sons as worthy as their sires of old
Her borrowed sceptre still unbroken hold
Till a new Rush [illegible] to think
An unborn Leidy finds the missing link.

Oliver Wendell Holmes
Boston, April 28th 1892

FIG. 5. The last page of the original manuscript of Holmes' "Lines." See footnote 26 regarding the variant versions of the next-to-last line

Strayed through some quiet ward, and looking round,
In pitys sheltering arms the lost was found.[25]

Enough. Enough! these eyes will overflow
In sweet remembrance of the debt I owe,—
A debt 'twould bankrupt gratitude to pay,—
But heaven perhaps will hear me when I pray

Peace to your borders! Long may science reign
Supreme, unchallenged o'er her old domain!
While sons as worthy as their sires of old
Her borrowed sceptre still unbroken hold
Till a new Rush shall teach his time to think[26]
An unborn Leidy find the missing link.

Oliver Wendell Holmes
Boston, April 28th 1892

Four days after the dinner, at the meeting of the College on May 4, 1892, Oliver Wendell Holmes, then in his eighty-third year, was elected an Associate Fellow of the College, joining in this status his Boston colleagues Henry P. Bowditch and David W. Cheever. The documents bearing on the proposal of Holmes as an Associate Fellow, "Proposition ⁂514," seem not to have survived. We do not know, therefore, who his sponsors were—but there can be little doubt that the proposal originated with the president of the College, Holmes' old friend S. Weir Mitchell. And so, with such pleasant memories as these, the Fellows of the College may justifiably this month of April read "The Contagiousness of Puerperal Fever" with a modest degree of family pride in a work and a man whose purpose and achievement it was to "teach his time to think." Philadelphia medicine as a whole, they may conclude, did not miss the Holmesian 'bus.

[25] A reference, doubtless, to the Civil War days. Holmes' son and namesake (later the eminent jurist) was wounded on the field of battle and brought to Philadelphia, where he was under the care of Dr Thomas G. Morton and Dr William Hunt, both Fellows of the College. "In a characteristic punning letter to Dr. Hunt, Dr. Holmes afterward acknowledged the services to his son with 'Good-by, my kind friend and my son's friend, whom I have delicately commemorated in my "Hunt after the Captain."' Later, as a further evidence of appreciation, he sent him author's copies of all his works published to that date, May, 1863." (Our *Transactions*, 1897, 3. *ser.*, 19, lii.)

[26] The "Boston" leaflet of the "Lines" gives this line as: "Till a new Rush arise who dares to think," and there are indications as Mr. Currier (footnote 16) points out, that our manuscript originally had the line, Holmes erasing it and substituting the line given here, which appears in the "1898" leaflet, the latter evidently based on our manuscript.

III

HOLMES LETTERS IN THE LIBRARY OF THE COLLEGE

1. To W. W. Gerhard, M.D., Philadelphia.

Hanover N. H. Sept. 30th 1839

My dear Sir,

I believe I may consider you as an old acquaintance, if a month or two's residence in Paris, a breakfast or two at the Café Procope, and a dinner or two in the Palais Royal and on the Boulevard in which I had the pleasure of being your companion give me any right to use such a term.[27] But besides this you must remember that you are getting to be well known among all of us,[28] even in these arctic regions, and so if I had never known you personally I should hardly feel like a stranger to one whom I so often mention and have mentioned.

—I have just published a book in company with Dr Bigelow,[29] and I do not write to ask a puff[30] but to correct a false impression which if you should ever happen to see the work and look into it you would certainly form.—

It is that I could either ignorantly or intentionally have omitted to do justice to the researches of yourself and M. Rufz on tuberculous meningitis.

Now the fact is first this. The last two thirds of the book were published since I have been lecturing in New Hampshire. A chapter which I had made out with great care on the disease in question and a shorter one on chronic hydrocephalus were certainly overlooked through some little accident in the reference or similar cause—and it was too late when on receiving the work I perceived the awful blank.

Now for such a misfortune as this it would be confoundedly hard to be tomahawked, and even if I must undergo this, I am determined that you shall understand the true state of the matter.

[27] See Holmes' "Lines" in Section II.

[28] Gerhard had already published, among other things, his work on tuberculous meningitis in children (1833–4) and his classic paper differentiating typhus from typhoid (1837).

[29] Their American edition of Marshall Hall's "Principles of the Theory and Practice of Medicine," 1839

[30] Gerhard was at this time one of the editors of a new Philadelphia journal called the *Medical Examiner*

Some other omissions and mistakes were also due to my absence.

If you will not think me guilty of designs upon you in your critical capacity (for I do not expect you to review the book, and certainly I have no fear that you or your colleagues have any prejudices against my collaborator or myself) I shall be pleased in returning you a little echo of your own name from the north. You have chosen your subjects so well and treated them with such clearness and exactness, that so far as I can tell there is only one opinion as to the position you are taking —and the prediction of our poor friend Jackson[31] (made to me in Paris) seems in the way of being realized. I say this to you because I have often said it to others—being at a distance, independent, and well enough if not too favorably thought of, I know that I cannot be misunderstood. At any rate it gives me pleasure to turn away from my own little narrow circle and say to one whom I shall rarely if ever meet, that all his labors and all his claims are duly appreciated at least by some who are far removed from his immediate influence —and that in this land of superficial essayists and spouting charlatans.—

And so you may take my tribute and apply to it all the heartless maxims of La Rochefoucault [sic] if you think it needs it.—

I have often wished to look in upon your great Philadelphia schools and meet my old friends once more. It is possible I may do such a thing one of these days but I have no such project at present.

Please remember me to my good friend Stuartson,[32] if as I hope, he is your friend—to Norris[33]— Peace and Johnston—my commensal at the Café Risbec in the benighted pays Latin—to D[r] Pepper and D[r] Clymer—one or all as you shall feel inclined.[34] [35]

Believe me very truly
Yours. O. W. Holmes

[31] The younger James Jackson, of Boston, whose promising career was suddenly terminated by his death, in 1834, shortly after his return to America.

[32] See footnote 2.

[33] See the "Lines" in Section II, and footnote 18.

[34] Norris, Edward Peace, (William P.?) Johnston, William Pepper (primus), and Meredith Clymer all were pupils of Louis.

[35] The letter evidently had the desired effect. The unsigned, generally very favorable, review in the *Medical Examiner* of October 26 contains these interesting sentences: "The chapters on tuberculous disease are also rather less perfect than other parts of the work. In that relating to the inflammation of the membranes of the brain in children, there occurs an omission which would have been supplied by the editors but for an unforeseen accident."

2. To an unnamed correspondent.[36]

Boston Sept. 13th
1863.

Dear Sir,

I mean to lecture a few times only this season as my time is already pretty well taken up with my daily duties at the College.

I do not know whether your Institution can afford to pay me a hundred dollars, but the distance and the necessity of sacrificing one of my College Lectures make that sum the amount of temptation required.

I could come at almost any time, but should prefer an evening early in the season.

The subject on which I shall lecture is one of general interest to Americans of all parties and which I think a mixed audience will listen to. I shall give its title with its first announcement, which will probably be either here or at Providence.

Yours very truly
O. W. Holmes.

3. To Joseph G. Richardson,[37] M.D., Philadelphia.

Boston March 18th
1873

My dear Sir,

Those "few lines" you were kind enough to say you would like to have in answer to your last of the 10th have come at length.

I am afraid I shall not visit Philadelphia very soon, but if I did one of the first things I would want to see would be your demonstration with high powers of those most interesting points of molecular organization which you would show me as I certainly have never seen them. My microscopic teaching is old-fashioned, and I leave the

[36] The letter was given to the library by the late Dr W. W. Keen, to whom it may well have been written, Keen, in 1863, being stationed at the Christian St Hospital, subsequently at the Turner Lane Army Hospital, from which came the famous Mitchell, Morehouse, and Keen studies on wounds of nerves in 1864.

[37] Dr Richardson (1836–1886), a Fellow of the College and a prominent microscopist, in 1871 published what may have been the first American textbook on medical microscopy, a field to which Holmes contributed the invention of the stereoscope for hand use.

nicer work, which requires super-vision in the microscopic laboratory to our young men from the German schools, as I leave the dissecting room work to my Demonstrator. Four or five lectures a week for seven months are as much as I care to attend to, and we have a good many young specialists at work to fill up the details of teaching in the different branches. The majority of our classes will never do more than acquire a tolerably well balanced symmetrical equipment in each of the branches they are expected to study, and for those who wish to go into microscopic details for themselves there is nothing like a young enthusiast for a teacher, with plenty of time and the rowels of stinging ambition working deep into his flanks. I think the formal scholastic *Lecture* has its use, and the old-school instructor his place, but I am fast recognizing the fact that after having taught an entire generation, a new generation has sprung up from which I in my turn have to learn. In simple truth I often feel that I should like to go to school in many things to some who but a few years ago were my pupils—and a lesson from you on the salivary globules and white corpuscles would be worth coming to Philadelphia for.

The doctrine of your "Introductory Lecture" as to the Extinction of the Unfit is one which in [one word undeciphered] I have long held. Will you let me quote a sentence or two from my Address "Currents and Counter-currents" delivered in 1860, and reprinted in a volume of Essays etc. 1861.

"Many affections which art has to strive against might be easily shewn to be vital to the well-being of society. Hydrocephalus, tabes mesenterica and other similar maladies, are natural agencies which cut off the children of races that are sinking below the decent minimum which nature has established as the condition of viability, before they reach the age of reproduction. They are really not so much diseases as manifestations of congenital incapacity for life; the race would be ruined if art could ever learn always to preserve the individuals subject to them."

I was interested and amused by your story about your youngest. I am never tired of watching the hereditary and congenital instincts of children, and now that my youngest son has introduced to my acquaintance a young gentleman of the third generation from myself I am every day watching for the development of the various family traits he has a right to.

I have written more than those few lines I spoke of at the beginning but you must consider this quite exceptional as I should soon get scrivener's palsy if I attempted correspondence on this scale with those distant friends who have interested me by their communications.

Believe me
Very truly yours
O W Holmes

4. [To W. W. Keen, M.D., Philadelphia.][38]

Boston Jan. 15th 1875

My dear Sir,

I have read your Introductory[39] with vastly more pleasure than I receive from most of these performances whether written by myself or others. I am not sorry to say that we have given them up in our school, though if they could all be like yours I should be sorry to lose them.

To prove that I have read and carefully read your lecture I am going to point out a few trifles which may possibly interest you—as nothing is trifling to an author which a critical—or as in this case a hypercritical reader can detect. You will smile at the trivial character of these harmless annotations, which are evidently written to shew that the critic knows something about old books and has a few of them in his library.

I have two editions of Vesalius one of them dated 1555. There are one dog, one goat, and one ape in the "perfect menagerie" you speak of.

I have a fine edition of Spigelius. On two panels of the piece of furniture which figures in his frontispiece are representations of an ape and of a wild boar, which I suppose will serve well enough for your need.

Have you ever seen the "Anathomia Mondini"? I have a copy of it in the scarce collection of medical tracts of Joannes de Ketam (1522) the same as the "Isagoge" of "Jacobus Berengarius Carpensis" more commonly called "Carpi" according to Bayle & Thillaye. I see you use both names. I have a very fine copy of this [superscript: I mean Beren-

[38] The library has only a photostatic copy of this letter to Dr Keen, internationally known surgeon and president of the college, 1900–1. The identity of the addressee and of the "Introductory" was deduced by me from internal evidence.

[39] Keen, W. W. A Sketch of the Early History of Practical Anatomy. The Introductory Address to the Course of Lectures on Anatomy at the Philadelphia School of Anatomy. Tuesday, October 6, 1874. Phila.: Lippincott: 1874.

garius] which according to Haller disputes with J. de Ketam the honor of the first anatomical plates published (I quote from memory the Bibl. Anatomica.)

P. 10 Ingrassius for Ingrassias.

P. 13 Should not Craig*ee* be Craigie?

P. 26 Etienne*s* should be Etienne. I have his very curious work with the most absurd anatomical figures I have ever seen.

You must rap your printer's head for *carnosa spartes* on p. 28.

Why *Sir Francis* instead of Bacon or Lord Bacon? It is of course correct but I think unusual. He was not in the peerage until 1618 it is true but he is commonly called by his later title.—This is *very* trivial but I stared when I read "Sir Francis Bacon".

P. 41 *Ab*ucasis should be *Al*bucasis. Haller cites also "Ab*ul*casis".

When I was at Leyden in 1833 or 4 they shewed me the injected mask of a child which was attributed to Ruysch. Such at least is my recollection, and as I have always told the story so I believe it.

I have been greatly pleased with your lecture and you understand that all these notes and [two words undeciphered] I have picked out amount to next to nothing.

But do not we all love to shew that we too are Arcadians? I like old books and old knowledge and I have a very strong fellow-feeling for others who like them. I thank you very cordially for the pleasure your polite attention in sending me your lecture has been the means of affording me.

Believe me my dear Sir
Very truly yours
O W Holmes.

5. To Joseph G. Richardson, M.D., Philadelphia.

Boston Dec. 22d 1877

Dear Dr. Richardson,

I have not thanked you for the pamphlet you sent me and which has been lying on my table to be read before being acknowledged. I have read it at last and found it very interesting—not the less so because you did me the honor to hand round one of my Lecture-room microscopes.[40] We are so vain of our little gimcracks!

—I am going to take advantage of an offer of yours and tell you of one or two very common objects of which I wish somebody would put me up really good specimens, for love or money. I never have found them in the shops and I have not time to put up preparations—that is I have got out of the way of it and put away my conveniences. I will mention three and if any time you find good specimens in your examinations when you are putting up specimens—or if you can find them at the shops and give me an address or send them telling me the cost, it would save me some trouble every year

1. Well characterised connective-tissue corpuscles.

2. Organic muscular fibre *shewing the nuclei* clearly.

3. Large well marked columnar epithelium.

I have no satisfactory section of mucous membrane of stomach or intestine shewing the crypts with the living epitheleum—especially the peptic cells in the gastric mucous membrane.

But give yourself no trouble about it, unless some of these things come in your way.

Very truly yours
O W Holmes

6. To the same.

Many thanks, dear Dr. Richardson for your kindness in sending me the wicked verses. They are very pungent—but I am glad I did not write them.

Very truly yours
O W Holmes

Beverly Farms, Mass.
July 8th 1880

7. To Charles W. Dulles, M.D., Secretary of the College of Physicians of Philadelphia.

Boston
May 7th 1892

Dear Sir

I am happy to accept the position of Associate Fellow of the College with which as you inform me I have been honored.

Very respectfully yours
Oliver Wendell Holmes.

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[40] At the conclusion of the discussion of Christopher Johnston's paper, "The Microscopy of the Blood", at a section meeting of the International Medical Congress of Philadelphia, 1876, Dr Richardson invited "the members of the Section to inspect, beneath a Holmes's class microscope, a red disk of the Amphiuma tridactylum. . ." (*Trans. Internatl. Cong. Phila.*, 1877, p. 488).

Memoir of William Toy Shoemaker*

By WILLIAM ZENTMAYER

WILLIAM TOY SHOEMAKER, who died November 26th, 1942, was born in Philadelphia, January 22nd, 1869, the son of Julien Shoemaker of Plymouth Meeting, Pennsylvania and Hannah Ann Hester Shoemaker of Trenton, New Jersey. His preliminary education was obtained in the Public Schools of Philadelphia. He was graduated from the Central High School with the degree of A.B. He received the degree of Doctor of Medicine from the University of Pennsylvania School of Medicine in 1891. He interned at the German Hospital, now the Lankenau Hospital, in Philadelphia. Later he studied Ophthalmology in Göttingen, Heidelberg, Berlin, Vienna and London. On his return to Philadelphia, he began the practice of Ophthalmology. At various times he was Surgeon to the Pennsylvania, Germantown, Lankenau and the University of Pennsylvania Graduate Hospitals; Professor of Ophthalmology and Vice-Dean of the Group in Ophthalmology of the Graduate School of Medicine of the University of Pennsylvania; Clinical Professor of Ophthalmology at the Woman's Medical College of Pennsylvania and executive medical officer of the Lankenau Hospital.

He was a Fellow of the American Medical Association, a Member of his State and County Medical Societies, a Member of the Association for Research in Ophthalmology, a Fellow of the American Ophthalmological Society, a Fellow of the College of Surgeons, a Fellow of the College of Physicians of Philadelphia and one time Chairman of its Section on Ophthalmology. His term of office as Chairman was interrupted by his Army Medical Service abroad in the first World War.

During World War I, he served as Major in the United States Army with the Pennsylvania Base Hospital № 10, which took over the British № 16 General Hospital, B. E. F., Le Tréport, France. Later he was Consultant Ophthalmologist on the Consultant Staff of Base Section №3 in London, A. E. F. He was overseas 19 months.

He received the Alvarenga award from the College of Physicians of Philadelphia, for his essay on "Retinitis Pigmentosa". He contributed chapters on various eye subjects in text-books, encyclopedias and in the journals. He was, for a time, editor of the Annals of Ophthalmology.

His fraternity was the Alpha Mu Pi Omega (Medical). He was a member of the Union League, Military Order of Foreign Wars and Military Order of World War I.

On June 6th, 1895, he married Miss Mabel Warren of Boston. They had six children, four sons and two daughters. He is survived by two daughters, Mrs. David C. Cleland and Mrs. Albert Zimmermann; three sons, J. Warren of Winchester, Massachusetts, Theodore of Lexington, Massachusetts and Robert C. of Portland, Oregon.

Dr. Shoemaker was a keen clinician and an excellent clinical teacher. His surgical judgment was sound, he was eminently practical and his technique was original as evidenced by his well known and widely adopted modification of the Motais operation for ptosis.

He was slow to discard the teaching of the early masters and looked somewhat askance at the importance attached to experimental research, evidently believing with Priestly Smith that too much credence should not be given to theories based upon experimental data when at variance with those based on clinical and pathological findings.

His contributions to the literature were not numerous because he would not write unless he had something original to communicate. He adopted the same principle in scientific gatherings, so that he never discussed a paper unless he could add something of value to the subject presented.

His writings contain many unique descriptive phrases and doubtless he had often to restrain his rather sharp wit which was so characteristic of his comments when conversing with an intimate friend.

As an editor, he was discerning in his selection of articles for publication and, at times, aroused

* Read at the meeting of the Section on Ophthalmology, The College of Physicians of Philadelphia, December 17, 1942, and printed in *Archives of Ophthalmology*, 1943, **29**, 307–309.

criticism from an author by the free use of an editor's prerogative. His book reviews were far from perfunctory, and were at times diverting.

His executive ability was attested by his appointment as executive medical officer of a general hospital and as the vice-dean of a medical school.

Dr. Shoemaker's life was rich in friendships and he had the devotion of his family, the respect and esteem of his colleagues, and students, and the loyalty of his patients. He was kindly and friendly but reserved.

In his later years, if in a pensive mood, he could recall a life of accomplishments, of achievements and of happiness.

Edward Jackson—A Founder of the Section on Ophthalmology of the College of Physicians of Philadelphia*

(The personal appreciation of BURTON CHANCE)

THE modern development of Ophthalmology had progressed so far by 1890, and the number of practitioners in the region of Philadelphia had increased to such an extent, that the Fellows of the College of Physicians, specializing in Ophthalmology, decided that they ought to petition the College to allow them to hold separate meetings at which their subjects might be discussed with greater attention than was then feasible at the meetings of the College. After serious consideration by the College, permission was granted, on November 5, 1890 to the fifteen Fellows, who had signed the petition to form themselves into a body, "to discuss subjects connected with Ophthalmology"; and, a small lecture-room was placed at their disposal, for one evening each month. It was definitely ordered, however, that those petitioners were not to become a society of Ophthalmologists independent of the College, but should be simply a grouping of Fellows subject to the official regulations of the College.

The first scientific meeting of the group was held on Thursday, November 16, 1890, at which Dr. William F. Norris was chosen Chairman, and Dr. Edward Jackson, Secretary.

Meetings were held regularly in the winter months, and, in time, gatherings developed into an organization occupying a distinguished place in medical affairs not only of Philadelphia but of the ophthalmic world; and, the College, recognizing the importance of the 'Society', in April, 1893, formally decided that it should become a permanent "Section" of the College, the first of the extant Sections formed for the transaction of scientific business.

Dr. Jackson was the most active person in the group. He had influenced them to join in the proposed organization, having, personally, written letters to the Fellows suggesting the project and urging them to sign the petition, and, for the four years during which he acted as Secretary, the notes in the record book of the meetings and the abstracts of the scientific transactions are in his handwriting. It must have been highly gratifying to him to serve with Drs. Norris, Harlan, Thomson and Oliver at the first meeting of this permanent organization on November 12, 1893.

Edward Jackson was born in Chester County, Pennsylvania, March 30, 1856, of a long line of Quaker ancestry, who had endowed him with the personal characteristics so distinctively manifested by the members of the Society of Friends. Jackson's first intention was to become an engineer, and he graduated from the Scientific department of Union College, New York, in 1874. But that profession proving distasteful to him, he determined to take up Medicine. Entering the Medical School at the University of Pennsylvania, he finished the course in 1878, immediately assuming practice in West Chester, where he continued for six or seven years and then moved to Philadelphia.

Almost from the beginning of his medical studies he became interested in and devoted to Ophthalmology, the mathematical studies of the science, particularly, having attractions for him, without, however, a lessening of his occupation in the medical and surgical aspects of practice. Soon deciding to become an Ophthalmologist he determined that he would excel and that no matter how tedious and distasteful the course might be he would achieve success. In 1888 he joined the Polyclinic and School for Graduates in Medicine as Professor of Ophthalmology. Soon he became recognized as an authoritative teacher both here and abroad. In 1890 he was elected one of the surgeons of Wills Hospital.

A glance at a list of the subjects of the papers and reports published by him up to that date will impress one of his worthiness both as an absorbed scientist and the active, forceful clinician. These publications relate not only to the refraction and motility of the eyes, in which chapters he has ever

* Read at the meeting of the Section, December 17, 1942. Publ., *Am. J. Ophth.*, 1943, *26*, 209.

been outstanding as an authority, but to actual disease and prevention as well as to the surgery of the eye and adnexa, while never failing to relate the ocular symptoms with those of the body in general.

In 1894, because of the ill health of his wife, Dr. Jackson went out to Denver, Colorado, but he did not sever his Philadelphia connections. He returned after several months to conduct classes at the Polyclinic. In spite of that temporary residence in Denver, he, with indefatigable industry, interested himself deeply in both local and general medical affairs, and published numerous papers based upon his studies and observations in previous years, and endeavored to lay the foundations of a permanent residence in Colorado.

At the expiration of his leave of absence from the Wills Hospital, he returned to Philadelphia, and for one month actively attended his services at the Hospital. I had known him prior to this and had learned much about him from his former Chester County confreres, but his service that month at Wills became the memorable one of my own life. I was house surgeon and was his assistant and had the care of his patients. A 'Cataract Week', too, had been planned for the Polyclinic students. Several patients were operated on daily. My experience at the Hospital had given me an appreciative estimation of what surgery could accomplish, yet I was especially impressed by the 'technic' and success attending Dr. Jackson's performance; deftness, neatness, and prompt dispatch were the outstanding features. He commonly employed 'Simple Extraction', for which he used a knife of his own devising, a combination of a Beers' and a "Graefe", with which he made a high corneal incision. Rarely had he to perform a secondary capsulotomy. My tabulated records of that period have been mislaid, yet I recall that the average stay of the patients was only eleven days. My first cataract operation was on one assigned to Jackson's clinic.

At the end of the month Dr. Jackson returned to Colorado, but he came East again in 1896, determining, however, to reside permanently in Denver. In 1898 he went back to Colorado, where, in time, he became Professor of Ophthalmology in the University of Colorado, a Chair he occupied until 1921. He organized Summer Courses for several successive years, to which resorted Ophthalmologists from all parts of the country.

He was a true teacher and Mentor, displaying a genius for Ophthalmology. Always the professor and guide, both as the private practitioner and in his relation to the public health.

He was a most exact and conscientious observer; a student all his days. In his teaching and in consultation he was a severe yet kindly critic of his fellows, while at the same time equally critical of himself.

He had been elected a Fellow of the College in 1885. He always held his association with this Section deeply. It had been instituted by him; it was through his inspiration that the Fellows were brought together; and, the Section was a growing concern by the time he removed to Denver. His experience in Philadelphia taught him how to organize professional groups elsewhere. He was one whose respect for his vocation was so great that from his earliest days, in season and out of season, he sought to place before the general medical men the ideals he, himself, strove to observe, what part the ophthalmologist should take in his position in the profession, as well as to insist upon what should be accorded to Ophthalmology for what it had done for General Medicine. He was always the leader. As a teacher, his horizon was never the classroom, but the wide world.

He maintained his Fellowship in this College to the end. His membership in Societies included all those in this country devoted to Ophthalmology. All of us know of the offices he held in them, President or Chairman, in local and national associations. Rarely did he attend a meeting without contributing a learned and useful essay; rising to discuss others on the program. In his own quiet way, he was always animated, always awake. At meetings the older members usually would wait before closing, expecting he would summarize and fix the topic in the assembly's mind, either in a recounting of an experience of his own, or by an analysis of the author's contribution. In argument and debate he was always considerate of his opponent, eagerly yet quietly seeking to present the truth as he had acquired it, backing up his statements by references to accepted authorities drawn from his marvelous knowledge and memory of what had been published the world over. At the meeting of the American Ophthalmological Society last May–June, he, well past the eighty-sixth year of his age, not only gave his own paper, but discussed several others—all with the freshest and ripest of spirit!!

From others who intend to write of the life and works of Dr. Jackson you might be given analyses of the subjects of his publications arranged as though for the chapters in the medical sciences. I would refer only to the titles of what he put forth during his stay in Philadelphia. As one reads those titles it is to be noted that they stand as the bases of all the hundreds he published from Denver. Nothing in medicine could be insignificant to him, and by comment and editorials, to which he was never afraid to sign his name, he endeavored to present the facts or principles to the understanding of his readers.

Every aspect of Ophthalmology interested him, he investigated all to the utmost with his inquisitive, well-ordered mind. His editorship of numerous journals and his authorship of separate works must be well known to you. His literary output was so extensive that a mere list of the titles and dates would fill many pages. In this element, too, of his endeavors he was the servant of his fellows, always the purveyor of knowledge and timely discoveries. The Year Books and Ophthalmic Literature alone, edited and issued under his own hand for a number of years until absorbed with the American Journal, are a monument of this feature. He did not confine his publications to the special journals, but sought to present facts and principles relating to Ophthalmology in other journals of world-wide issue and influence. His writings were as expressive as his speech, simple, straightforward, and, in their simplicity, graceful.

In 1926, in honor of his 70th birthday, his pupils and colleagues in the United States dedicated a collection of their papers which were published in a special volume as a fitting tribute to his personality and his life work among us. At the Wills Hospital is a striking portrait painted in 1939 to serve both as honor to the Hospital and in recognition of his greatness.

On the day of my first visit to him years ago, at his office on Seventeenth Street, I found him immersed in problems connected with Skiascopy, that process of refraction of which he became the greatest exponent. My last time with him was at the opening session of the Section on Ophthalmology of the American Medical Association, at Atlantic City, June, 1942. As we sat beside each other listening to papers on "The Signs of Old Age", he leaned over to me and said, with an amused twinkle "Those young fellows up there seem to know a whole lot about that subject". He might have stood up to refute, in his person, what they so voluminously were depicting as the characteristics of advanced years. Indeed, as already stated, only the week before he had taken part in the meeting of the Ophthalmological Society at the Virginia Hot Springs. For all the years I had known him, he seemed never to have changed, ever maintaining a slow, deliberate, calmly collected manner. During his time in Philadelphia I came under his influence at 17th Street; again when I took charge of the office of his close friend Charles Hermon Thomas, on Locust Street where he maintained an office and where George Gould occupied the second floor; and, at his last location, with Dr. Schneideman on Chestnut Street near 18th.

Many honors and prizes were awarded him in his long life and his portrait was painted for more than one group. These can express their own story, perhaps, but this Section of the College of Physicians of Philadelphia stands as a living memorial and we, to-day, should consider ourselves as his successors.

Tall and slender, Dr. Jackson, during the passage of years, seemed to have changed but little in his personal appearance. In his earlier days he wore a full black beard. Time did not seem to weigh heavily upon him, even up to last year. His death occurred quietly Thursday, October 29, 1942.

His was an air of preoccupation. Always alert, he seemed like a man who was listening, and ready to answer any question put to him, or to respond to any statement uttered within his hearing. In speech, his diction was concise; terse; unemotional; exact;—never redundant nor repetitive; calm; logical; expressive and never pedantic. While seemingly introspective, he was responsive, lighting up his statements with apt phrases and pleasing humor. For myself, I always felt that one should be learned to know how learned he was, and, while reserved in manner, he ever seemed to be offering something useful to him who needed to be reassured in his questing.

His life was indeed one of service. As soon as he had learned something useful, he prepared it as a speech or published it as a written essay or article for the good of his fellows. While deeply involved in his laboratory investigations and in clinical observations, he never avoided the opportunity to apply his researches to the needs of his patients or to instruct us in the correction of defects and the alleviation of affections of the sick and

suffering. While always absorbed in thought, he was no recluse.

A legion can look back to Edward Jackson's influence as the source of their success. He possessed to an extraordinary degree an influence which drew men together so that they might organize themselves into a body in order to both express their own observations and to formally present them to the world. It was impossible for him not to repeat the experiment of 1890 in Philadelphia.

Only a few remain to tell of Dr. Jackson's sojourn in this City, so that I humbly offer my tribute to so great a man based upon what I had known of him both as a Philadelphian, and when meeting him from time to time, almost annually, until June last. He was always the kindly friend, treating me as courteously when I first met him as when later he sought my help in certain projects.

In spite of the great successes which came to him in his life in the West, his affection for Philadelphia never waned. Miss Anderson, his long devoted assistant and Secretary, wrote to me that when Dr. Jackson was discouraged, his thoughts would return to his early days in Philadelphia, and, I know, they dwelt on recollections of those worthy men who developed the 'Philadelphia School of Ophthalmology' and helped him establish this Section of the College.

Transactions of the Sections

SECTION ON GENERAL MEDICINE

Joint Meeting,[1] January 25, 1943

THE ROLE OF HORMONES IN SEX DIFFERENTIATION AND DEVELOPMENT. Carl R. Moore, Ph.D. (Annual B. A. Thomas Oration of the Philadelphia Urological Society.)

Joint Meeting,[2] February 22, 1943

EFFECT OF SULFONAMIDE COMPOUNDS ON COORDINATION AND REACTION TIME. Alison H. Price,* M.D. (Commentator: Bernard J. Alpers, M.D.)

TREATMENT OF CARCINOMA OF THE PROSTATE BY CASTRATION. Boland Hughes, M.D. (Commentator: Alexander Randall, M.D.)

PRODUCTION OF TAURINE FROM CYSTEINE. Grace Medes,* M.D. (Commentator: Abraham Cantarow, M.D.)

TRICHINOSIS AND PERIARTERITIS NODOSA. DIFFERENTIAL DIAGNOSIS; POSSIBLE RELATIONSHIP. Hobart A. Reimann, M.D., Alison H. Price,* M.D., and Peter A. Herbut,* M.D. (Commentators: Charles L. Brown, M.D., and Herbert Ratcliffe,* Sc.D.)

Meeting, March 22, 1943

PITUITARY MYXEDEMA IN CHILDREN. Charles W. Dunn, M.D. (Commentator: Edward Rose, M.D.)

TREATMENT OF ULCERS AND OTHER LESIONS WITH BLOOD AND CONCENTRATED PLASMA. Meyer Naide,* M.D. (Commentator: Jonathan E. Rhoads, M.D.)

ACTIVE-PASSIVE IMMUNIZATION AGAINST TETANUS. Herman Gold,* M.D. (Commentator: Louis Tuft, M.D.)

A SYSTEM FOR AVOIDING PERSISTING SYMPTOMS AFTER GALLBLADDER SURGERY. W. Emory Burnett, M.D. (Commentator: George P. Rosemond,* M.D.)

* By invitation.

[1] With the Philadelphia Urological Society; held at the College.

[2] With the Section on Internal Medicine of The Philadelphia County Medical Society; held at the College.

SECTION ON OPHTHALMOLOGY

Joint Meeting,[3] January 21, 1943

EXUDATIVE LIPID OCULAR DISEASES. Parker Heath,* M.D.

Joint Meeting,[3] February 18, 1943

MALIGNANT EXOPHTHALMOS. A. S. Crandall,* M.D. (Commentator: Edward Rose, M.D.)

VOGT-KOYANAGI SYNDROME. Henry Abrams,* M.D.

PAPILLEDEMA IN ACUTE DISSEMINATED LUPUS ERYTHEMATOSIS. W. H. Steele,* M.D.

MALIGNANT MELANOMA OF THE CHOROID. G.M. Johnson,* M.D.

GLASS BLOWERS' CATARACT. G. J. Dublin,* M.D.

Joint Meeting,[3] March 18, 1943

SOME OCULAR MOTOR DISTURBANCES: A MOVING PICTURE CLINIC. David G. Cogan,* M.D.

SECTION ON OTOLARYNGOLOGY

Joint Meeting,[4] January 20, 1943

ORBITAL, OSSEOUS AND INTRACRANIAL COMPLICATIONS OF NAVAL ORIGIN. Francis Lederer,* Lt. Comm., M.C., U.S.N. (Commentators: Oscar V. Batson, M.D., Otto C. Hirst, M.D., and Benjamin H. Shuster, M.D.)

ANALYSIS OF 100 CONSECUTIVE EAR CASES IN AN ARMY GENERAL HOSPITAL. John J. Conley,* Capt., M.C., U.S.A. (Commentators: George M. Coates, M.D., and Horace J. Williams, M.D.)

Joint Meeting,[4] February 17, 1943

THE PROBLEM OF IMPAIRED HEARING. James A. Babbitt, M.D. (Commentator: George M. Coates, M.D.)

THE HEARING AID FROM THE PATIENT'S POINT OF VIEW. Walter Hughson, M.D. (Commentator: Oscar V. Batson, M.D.)

[3] With the Eye Section of The Philadelphia County Medical Society; held at the College.

[4] With the Philadelphia Laryngological Society; held at the College.

Joint Meeting,[4] *March 17, 1943*

RADIO NECROSIS AND CANCER OF THE HEAD AND NECK. Marshall B. Stewart,* Major, M.C., U.S.A. (Commentators: John V. Blady,* M.D., Louis H. Clerf, M.D., and Gabriel Tucker, M.D.)

THE AFTER IMAGE TEST. Frank A. Bridgett, M.D. (Commentator: George W. Mackenzie, M.D.)

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

Joint Meeting,[5] *January 28, 1943*

BONE SURGERY IN WARFARE. Fred H. Albee,* M.D.

Joint Meeting,[5] *February 15, 1943*

WHAT HAVE BEEN THE RESULTS OF THE IMMEDIATE AND LATE REPAIR OF PERIPHERAL NERVE INJURIES FOLLOWING CASUALTIES IN WAR AND INDUSTRY? C. M. Shaar,* Capt., M.C., U.S.N., W. Wayne Babcok, M.D., Joseph C. Yaskin, M.D.

[5] With the Section on Industrial Health, and the Section on General and Industrial Surgery, of The Philadelphia County Medical Society; held at the Society's building.

Officers, Committees, Sections, and Administrative Staff of the College, 1943

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Stanley P. Reimann
William G. Turnbull

To serve until January, 1945
Francis C. Grant
J. Stewart Rodman

To serve until January, 1946
Earl D. Bond
Ralph S. Bromer

Council

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Burton Chance
The Honorary Librarian (*ex officio*)

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Hubley R. Owen

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Maurice S. Jacobs
Aims C. McGuinness
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The President (*ex officio*)

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Chairman, John H. Arnett
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W. B. McDaniel, 2d

Curator of the Mütter Museum and the College Collections
Joseph McFarland

Clerk, Olga E. Lang
Assistant Clerk, Helen M. Nash

Superintendent, Charles R. French

Fellows

April 1, 1943

ELECTED

1934. Abbott, William Osler, 133 S. 36th St.
1912. Addison, William H. F., Medical Laboratories, Univ. of Pa.
1926. Adler, Francis Heed, 313 S. 17th St.
1914. Aiken, Thomas G., Berwyn, Pa.
1936. Aldridge, Fred Cutler, Wayne, Pa.
1936. Alexander, Fay Knight, Fitzgerald Mercy Hospital, Darby, Pa.
1906. Allen, Francis Olcott, Jr., 2216 Walnut St.
1932. Allen, Frederick H., 1711 Fitzwater St.
1935. Alpers, Bernard J., 111 North 49th St.
1933. Alston, Robert S., 121 Walnut Lane.
1905. Anspach, Brooke M., 1827 Spruce St.
1930. Appel, Kenneth E., 111 N. 49th St.
1905. Appleman, Leighton Francis, 308 S. 16th St.
1935. Armitage, George L., 400 E. 13th St., Chester, Pa.
1922. Arnett, John H., 2116 Pine St.
1942. *Aronson, Joseph D.
1941. *Aronson, Roland S., Medical Corp., U. S. Army, Barnes General Hospital, Vancouver, Wash.
1920. Astley, G. Mason, 812 N. 63rd St.
1935. Atlee, John L., 37 E. Orange St., Lancaster, Pa.
1935. Atlee, John L., Jr., 37 E. Orange St., Lancaster, Pa.
1914. Austin, J. Harold, 821 Maloney Clinic, Univ. of Pa.
1906. Babbitt, James A., 1912 Spruce Street.
1935. Bach, Theodore F., 1900 Rittenhouse Sq.
1942. *Bachman, Carl.
1937. Bacon, Emily P., 2104 Spruce St.
1916. Balentine, Percy L., 407 Weightman Bldg., 1524 Chestnut St.
1898. Balliet, Tilghman M., 3920 Sansom St.
1940. Banes, C. C. A., 2043 N. 12th St.
1934. Bank, Joseph, 715 E. Monroe St., Phoenix, Ariz.
1940. Barba, Philip S., 222 W. Harvey St., Germantown.
1911. Barnard, Everett P., 1820 S. Rittenhouse Sq.
1939. Barnshaw, H. D., 406 Cooper St., Camden, N. J.
1939. Bartle, Harvey Jr., 133 S. 36th St.
1924. Bartle, Henry J., 1930 Chestnut St.
1931. Bates, William, 2029 Pine St.
1932. Batson, Oscar V., 3502 Hamilton St.
1921. Bauer, Edward L., 1609 Spruce St.
1933. Bauer, John T., Pennsylvania Hospital.
1939. Baumann, Frieda, 1930 Chestnut St., Phila.
1922. *Bazett, Henry C.
1938. Beach, Edward Warren, 4400 Walnut St.
1908. Beardsley, E. J. G., 1919 Spruce St.
1930. Beardwood, Joseph T., Jr., 2031 Locust St.
1935. Beerman, Herman, Chatham Court Apts., 49th and Locust Sts.
1932. Behney, Charles A., 3722 Chestnut St.

* On active service.

1942. *Behrend, Albert.
1934. Behrend, Moses, 1738 Pine St.
1930. Belk, William Parks, Times Medical Bldg., Ardmore, Pa.
1936. Bell, Benjamin Tertius, 1930 Chestnut St.
1943. *Berk, J. Edward, 4639 N. 12th St.
1941. Bernstein, Mitchell, 1321 Spruce St.
1937. Bertolet, J. Allan, 1530 Locust St.
1934. Biddle, Sydney Geoffrey, 255 S. 17th St.
1918. Billings, Arthur E., 2020 Spruce St.
1917. Birdsall, Joseph C., 139 Booth Lane, Haverford, Pa.
1933. Bishop, Paul A., Pennsylvania Hospital.
1917. Block, Frank B., 136 S. 16th St.
1929. Bockus, Harry L., 250 S. 18th St.
1928. Boles, Russell S., Rittenhouse Plaza.
1923. Bond, Earl D., 707 Old Lancaster Road, Bryn Mawr, Pa.
1911. Bonney, Charles W., 255 S. 17th St.
1924. Boon, David J., 1532 N. 15th St.
1931. *Bortz, Edward Le Roy, 2021 W. Girard Ave.
1921. Borzell, Francis Frank, 4940 Penn St., Frankford.
1936. Bostwick, Delazon Swift, 106 Linwood Ave., Ardmore, Pa.
1928. *Bothe, Albert E.
1928. Bothe, Frederick A., 255 S. 17 St.
1923. Bower, John O., 2008 Walnut St.
1942. Bowie, Morris A., 910 Old Lancaster Road, Bryn Mawr, Pa.
1907. Boyer, Henry P., 4602 Baltimore Ave.
1925. Boykin, Irvine M., 136 S. 16th St.
1929. Bradbury, Samuel, 151 W. Coulter St.
1907. Bradley, William Nathaniel, 1725 Pine St.
1942. Branen, William, Whitby & Cypress Ave., Yeadon, Pa.
1921. Bransfield, John W., 2101 Spruce St.
1903. Branson, Thomas F., Rosemont, Pa.
1917. Bromer, Ralph S., 318 Milbank Road, Bryn Mawr, Pa.
1936. Brown, Charles L., 325 N. Bowman Ave., Merion, Pa.
1932. Brown, Claude P., 1930 Chestnut St.
1919. *Brown, Henry P., Jr.
1887. Brubaker, Albert P., 109 N. 34th St.
1939. Brust, Raymond W., 4710 Chester Ave.
1935. Buchanan, Mary, 1737 Chestnut St.
1930. Bucher, Carl Joseph, 271 S. 15th St.
1943. Buerki, Robin C., University of Pa.
1928. Burden, Verne G., 255 S. 17th St.
1940. Burnett, W. Emory, 3401 N. Broad St.
1906. Burns, Stillwell C., 1238 Atwood Rd.
1892. Burr, Charles W., 1512 Spruce St.
1941. Butler, Miriam, 1831 Chestnut St.
1906. Butler, Ralph, 1930 Chestnut St.
1934. Buzby, B. Franklin, 414 Cooper St., Camden, N. J.
1907. Cadwalader, Williams B., 133 S. 36th St.
1928. *Campbell, Edward H.
1931. Cantarow, Abraham, 2033 Delancey St.
1935. Carey, Lawrence S., 1930 Chestnut St.

* On active service.

1931. Cariss, Walter L., 2043 Walnut St.
1930. Carpenter, Chapin, 1930 Chestnut St.
1905. Carpenter, Herbert B., 1805 Spruce St.
1926. Carpenter, Howard Childs, 1805 Spruce St.
1895. Carpenter, John T., 1930 Chestnut St.
1917. Carson, John B., 1802 Pine St.
1922. Case, Eugene A., 63 W. La Crosse Ave., Lansdowne, Pa.
1937. Castallo, Mario A., 2126 Spruce St.
1943. Castigliano, S. Gordon, 881 Wynnewood Road, Overbrook, Phila.
1933. Chamberlain, W. Edward, Temple University Hospital.
1939. Chamberlin, George W., Reading Hospital, Reading, Pa.
1900. Chance, Burton, 317 S. 15th St.
1939. Charr, Robert Kyun Hyun, 2038 Locust St.
1941. *Cheleden, John.
1903. Chrystie, Walter, Bryn Mawr, Pa.
1939. Ciccone, Emmet F., 312 N. 33rd St.
1929. Clark, Eliot R., 315 S. 41st St.
1934. Clark, Jefferson Hamer, 3701 N. Broad St.
1926. Clerf, Louis H., 1530 Locust St.
1910. Cloud, J. Howard, 11 W. Montgomery Ave., Ardmore, Pa.
1903. Coates, George Morrison, 1721 Pine St.
1908. Codman, Charles A. E., S.E. Corner 42d and Spruce Sts.
1941. *Cohen, J. Gershon, 255 S. 17th St.
1922. Cohen, Leon Solis-, Jewish Hospital, York and Tabor Roads, Phila.
1907. Cohen, Myer Solis-, 2110 Spruce St.
1888. Cohen, S. Solis-, 1906 Walnut St.
1920. Cole, Charles J., 7926 Park Ave., Elkins Park, Pa.
1934. Colgan, Robert C., 5882 No. Marshall St.
1934. *Collins, Leon Howard, Jr.
1943. Colonna, Paul C., Univ. of Pa. Hospital.
1939. Comroe, Bernard I., 1726 Pine St.
1930. Cooper, David A., 1520 Spruce St.
1941. Cornelius, Chalmers E., 119 Summit Ave., Jenkintown, Pa.
1911. Cornell, Walter S., Board of Public Education, Parkway and 21st St.
1914. Corson, Edward F., 136 S. 16th St.
1930. *Cottrell, James E.
1924. Cowan, Alfred, 1930 Chestnut St.
1940. *Cowan, Thomas H.
1904. Craig, Frank A., The Henry Phipps Institute, 7th and Lombard Sts.
1942. Craighill, Margaret D., Woman's Medical College.
1907. Crampton, George S., 2031 Locust St.
1937. *Crane, Martin P.
1920. Creighton, William J., 37 S. 20th St.
1941. Creskoff, Adolph J., 3400 Spruce St.
1920. Cross, George H., Chester, Pa.
1917. Cross, Sumner H., P. O. Box 126, Jenkintown, Pa.
1921. *Crossan, Edward T.
1940. Crowe, Aldrich C., 735 Atlantic Ave., Ocean City, N. J.
1904. Cruice, John M., 407 S. 22d St.
1937. Crump, Jean, 1930 Chestnut St.
1937. Curtis, Lawrence, 255 S. 17th St.

* On active service.

1934. *Custer, R. Philip, Orchard Lane, Haverford, Pa.
1941. *Cuttle, Tracy D.
1938. Dannenberg, Arthur M., 235 S. 15th St.
1919. Davies, John R., Jr., 2 E. Chestnut Ave., Chestnut Hill.
1936. Davis, David M., 225 S. 17th St.
1937. *Davis, Perk Lee.
1916. Davis, Warren Beagle, 135 S. 18th St.
1900. *Davisson, Alexander H., 4514 Springfield Ave.
1935. *Deaver, J. Montgomery.
1902. Dehoney, Howard, 240 S. 13th St.
1935. Deibert, Irvin Elmer, 538 Cooper St., Camden, N. J.
1924. Deichler, L. Waller, 1930 Chestnut St.
1923. De Long, Perce, N.E. Cor. 20th and Chestnut Sts.
1928. Dewees, A. Lovett, Times Medical Bldg., Ardmore, Pa.
1924. Dillon, Edward S., 2016 DeLancey St.
1932. Dintenfass, Henry, 1305 Spruce St.
1920. Diven, John, 326 S. 19th St.
1941. Dixon, Harold M., 4107 Chester Ave.
1920. Doane, Joseph C., 19th and Spruce Sts.
1942. Donnelly, Edward J., 1721 W. Girard Ave.
1933. Donnelly, Joseph C., 2008 Walnut St.
1937. Donnelly, Robert T. M., 255 S. 17th St.
1907. Dorrance, George M., 2101 Spruce St.
1933. *Downs, T. McKean.
1910. Drayton, William, Jr., 2028 Delancey St.
1935. Duane, William, Jr., 1928 Delancey St.
1935. *Duncan, Garfield G.
1937. Dunn, Charles W., 269 S. 19th St.
1942. Durant, Thomas M., Broad and Ontario Sts.
1942. Dyer, W. Wallace, 2016 Delancey St.
1935. *Eads, John T.
1911. Earnshaw, Henry C., Bryn Mawr, Pa.
1936. Easby, Mary Hoskins, 1930 Chestnut St.
1937. Edeiken, Joseph, 1832 Spruce St.
1930. Eiman, John, Cynwyd, Pa.
1911. Eliason, Eldridge L., 326 S. 19th St.
1939. Ellis, Van Mashburn, 1530 Locust St.
1928. Ellison, Richard T., 1614 Locust St.
1936. *Ellson, J. Vernon.
1904. Elmer, Walter G., 1801 Pine St.
1937. *Elsom, Kendall A.
1934. Ely, William C., 3912 Chestnut St.
1932. Engel, Gilson G., 255 S. 17th St.
1942. Erb, William H., 4 Morton Ave., Ridley Park, Pa.
1893. Eshner, Augustus A., 1019 Spruce St.
1905. Evans, William, 500 W. Gay St., West Chester, Pa.
1922. Farley, David L., 4429 Larchwood Ave.
1903. Farr, Clifford B., Bryn Mawr, Pa.
1930. Farrell, John T., Jr., 255 S. 17th St.
1935. *Ferguson, Lewis Kraeer.
1936. *Fetter, Ferdinand, Naval Officer Procurement, Widener Bldg., Phila., Pa.

* On active service.

1935. Fetter, Theodore R., 255 S. 17th St.
1924. Fewell, Alexander G., 1924 Pine St.
1928. *Fitz-Hugh, Thomas, Jr.
1928. *Flick, John B.
1939. Flippin, Harrison F., 255 S. 17th St.
1940. *Forrester, James S.
1941. Fox, C. Calvin, 1806 Spruce St.
1906. Fraley, Frederick, 71st and City Line, Overbrook, Pa.
1941. *Frazier, William Doane.
1939. *Freeman, Norman E.
1935. Fridy, Cyrus Ward, 322 Riverview Ave., Drexel Hill, Pa.
1942. Friedman, Reuben, 877 N. 6th St.
1933. Fritch, James Scott, 269 S. 19th St.
1937. *Fritz, Herbert H.
1940. *Fry, Kenneth E.
1935. Fry, Wilfred Eyles, 1819 Chestnut St.
1937. Furlong, Thomas F., Jr., Times Medical Building, Ardmore, Pa.
1935. Gammon, Geo. D., Univ. of Pa. Hospital.
1931. Garner, Vaughn C., Germantown Professional Building.
1935. *Geist, Donald C.
1917. Gerhard, Arthur H., 1615 N. Delaware Ave.
1899. Gibbon, John H., Media, Pa.
1934. *Gibbon, John H., Jr.
1939. Gibson, Glen Gregory, 255 S. 17th St.
1933. Gifford, U. Grant, Kennett Square, Pa.
1920. Gill, A. Bruce, 1930 Chestnut St.
1931. *Gilman, Robert Louis.
1927. Gilmour, William R., 6616 Woodland Ave.
1931. Giordano, Anthony A. S., 1819 S. Broad St.
1906. Gittings, John C., Harwood, Md.
1906. Goepp, R. Max, 1333 Chestnut St.
1933. Goldburgh, Harold L., 1932 Spruce St.
1935. Goldsmith, Ralph, 136 S. 16 St.
1905. Gordon, Alfred, 1520 Spruce St.
1928. *Gordon, Burgess L.
1937. Gordon, William, 1721 Pine St.
1941. *Gouterman, Joseph I., Aberdeen Proving Grounds, Station Hospital, Aberdeen, Md.
1894. Graham, Edwin E., 1713 Spruce St.
1926. Grant, Francis Clark, Univ. of Pa. Hospital.
1933. Greenbaum, Sigmund S., 320 S. 18th St.
1940. Greene, Lloyd B., 136 S. 16 St.
1932. Griffith, George C., 4028 Walnut St.
1934. Griffith, John Q., Jr., 214 Glencoe Ave., Upper Darby, Pa.
1912. Griscom, J. Milton, 255 S. 17th St.
1941. *Groff, Robert A.
1933. Gruber, Charles M., Jefferson Medical College.
1932. Guequierre, Jacques P., Mermont Plaza, Bryn Mawr, Pa.
1935. Hadden, Samuel B., 37 S. 20th St.
1935. *Haines, Harlan F.
1939. Hamblock, Leonard C., 255 So. 17th St.

* On active service.

1894. Hamill, S. McC., 1822 Spruce St.
1897. Hand, Alfred, 1724 Pine St.
1938. *Hand, John G.
1932. Harris, Stanley E., Lansdowne, Pa.
1929. Harrison, Francis G., 1900 Spruce St.
1933. Harrison, William John, 135 S. 17th St.
1903. Hart, Charles D., 420 W. Mermaid Lane, Chestnut Hill.
1941. Hartley, Harriet L., 1719 Rittenhouse Square.
1932. Hartman, J. Calvin, 100 W. Walnut Lane.
1926. Hartmann, Fred L., 1914 Pine St.
1935. Haskell, Benjamin F., 1426 Spruce St.
1936. Hatch, Lerleen Clement, 747 Ardmore Ave., Akron, Ohio.
1907. Hatfield, Charles James, Henry Phipps Institute, 7th and Lombard Sts.
1911. Heed, Charles R., 1205 Spruce St.
1927. Herman, Leon, 136 S. 16 St.
1924. Hewson, William, 6013 Greene St.
1924. Hirst, John C., 2d, 500 N. 20th St.
1908. Hitchens, Arthur Parker, Medical School, Univ. of Pa.
1943. Hockaday, Agnes, 316 Shadeland Ave., Drexel Hill, Pa.
1939. *Hodes, Philip J.
1905. Hodge, Edward B., 2019 Spruce St.
1931. Holland, H. Albert, 8200 Crittenden St., Chestnut Hill.
1933. Hollingshead, Irving W., 123 S. 18th St.
1932. Hollingsworth, I. Pemberton P., 411 N. Walnut St., West Chester, Pa.
1919. Hopkins, Arthur H., 1726 Pine St.
1925. Hopkinson, R. Dale, Jenkintown, Pa.
1928. Houser, Karl Musser, 2010 Spruce St.
1938. Howell, John Carnett, 326 S. 19th St.
1937. Hughes, Joseph, 4401 Market St.
1939. Hughes, P. Boland, Alden Park Manor, Germantown.
1892. Hughes, William E., 3945 Chestnut St.
1937. Hughson, Walter, Abington Memorial Hospital, Abington, Pa.
1923. Hume, John E., N.E. Corner 20th and Chestnut Sts.
1921. *Hunter, Robert John.
1926. Husik, David N., 1820 Spruce St.
1934. Hustead, Frank H., 5112 N. Broad St.
1898. Hutchinson, J. P., Media, Pa.
1935. Ingleby, Helen, Woman's Medical College, Phila.
1921. Ivy, Robert H., 1930 Chestnut St.
1917. Jackson, Chevalier, 255 S. 17th St.
1932. Jackson, Chevalier L., 255 S. 17th St.
1934. Jacobs, Maurice S., 1831 De Lancey Place.
1941. *Jeffers, William A.
1913. Jeffreys, William H., 143 Gray's Lane, Haverford, Pa.
1928. John, Rutherford L., 256 S. 21st St.
1926. Johnson, George Ernest, 5341 Chester Ave.
1942. *Johnson, Julian.
1938. Johnson, Thomas A., 250 S. 18th St.
1918. Jonas, Leon, 255 S. 17th St.
1943. Jones, Charles Alexander, 1832 Spruce St.
1924. Jones, Harold W., 1930 Chestnut St.

* On active service.

1900. Judson, Charles F., 252 Kent Road, Wynnewood, Pa.
1902. Jump, Henry Draper, 1530 Locust St.
1936. Kain, Thomas M., 403 Cooper St., Camden, N. J.
1938. Kasper, Kelvin A., 135 S. 18th St.
1941. Kauffman, M. Luther, Medical Arts Bldg., Jenkintown, Pa.
1923. Kay, James, 600 W. Olney Ave.
1938. Keeler, Harold R., 1824 Spruce St.
1935. Kelly, George F. J., N.E. Cor. 20th and Chestnut Sts.
1932. Kelly, Herbert T., 1900 Spruce St.
1909. Kelly, James A., 1815 Spruce St.
1912. Kelly, Thomas C., 105 School Lane.
1941. Kennedy, Patrick J., 6910 Market St., Upper Darby, Pa.
1921. *Kern, Richard A.
1935. *Keyes, Baldwin L.
1930. *Kimbrough, Robert A., Jr.
1936. *King, Orville C.
1920. Klauder, Joseph V., 1934 Spruce St.
1920. Klein, Thomas, 250 S. 18th St.
1934. *Klemmer, Roland N.
1934. Kline, Oram R., 414 Cooper St., Camden, N. J.
1932. Klopp, John W., 618 W. Lehigh Ave.
1919. Knipe, Norman L., 1930 Chestnut St.
1908. Knowles, Frank C., 2035 Spruce St.
1938. Knox, Andrew, 1930 Chestnut St.
1925. Knox, Harry E., 719 66th Ave., Oak Lane.
1914. Kolmer, John A., Cynwyd, Pa.
1936. Konzelmann, Frank Williamson, 3638 N. 21st St.
1932. Kornblum, Karl, 1020 Sansom St.
1941. *Krall, J. Thomas.
1904. Kräuss, Frederick, 1930 Chestnut St.
1941. Krewson, William E., 3rd, 1930 Chestnut St.
1914. Krumbhaar, Edward B., School of Medicine, Univ. of Pa.
1907. Langdon, H. Maxwell, 1530 Locust St.
1933. Langdon, Roy L., 5917 Greene St., Germantown.
1941. *Langner, Paul H., Jr.
1934. *Laplace, Louis B.
1926. Laws, George M., 1907 Spruce St.
1936. Leaman, William G., 3700 Baring St.
1920. Leavitt, Frederic Headley, 1527 Pine St.
1941. *Leberman, Paul R.
1934. Lee, Thomas B., 622 Cooper St., Camden, N. J.
1908. Lee, Walter Estell, 1833 Pine St.
1942. Lehman, James A., 1815 Spruce St.
1936. Lehrfeld, Louis, 1321 Spruce St.
1935. Lemmon, William T., 1930 Chestnut St.
1920. Leopold, Simon S., 255 So. 17th St.
1933. Levering, J. Walter, Abington Memorial Hospital, Abington, Pa.
1915. Lewis, Fielding O., Providence Road, Media, Pa.
1938. Lewis, James P., 3815 Chestnut St.
1936. Lillie, Walter I., 255 S. 17th St.
1940. *Limberger, William A.

* On active service.

1938. *Lindauer, M. August.
1927. Lindsey, Walter H., 810 W. Dauphin St.
1936. Lintgen, Charles, 1930 Chestnut St.
1936. Llewellyn, Thomas H., 739 N. 40th St.
1941. Lockwood, John S., 301 Hathaway Lane, Wynnewood, Pa.
1907. Lodholz, Edward, Medical Laboratories, Univ. of Pa.
1931. Loewenberg, Samuel A., 1905 Spruce St.
1938. Long, Charles-Francis, 1836 Delancey St.
1933. *Long, Esmond R.
1935. Long, William L., 2025 Walnut St.
1893. Longaker, Daniel, 5702 Overbrook Ave.
1931. Longaker, Edwin P., 41 E. Montgomery Ave., Ardmore, Pa.
1942. Lownes, John B., 136 S. 16th St.
1936. Lucchesi, Pascal Francis, Philadelphia Hospital for Contagious Diseases.
1921. *Lucké, Balduin H. E., Army Medical Museum, 7th and Independence Ave., Washington, D. C.
1924. Ludy, John B., 136 S. 16th St.
1932. Lukens, Francis D. W., Cynwyd, Pa.
1938. Lukens, Philip Jefferson, Jr., 158 E. Butler Ave., Ambler, Pa.
1930. Lukens, Robert M., 1923 Spruce St.
1929. Lull, Clifford B., Women's Bldg., Penna. Hosp., 807 Spruce St.
1939. Luongo, Romeo A., 2054 Locust St.
1919. Lynch, Frank B., Jr., Germantown Hosp., Penn and Chew Sts.
1914. Lyon, B. B. Vincent, 1930 Chestnut St.
1933. McAndrews, Leo F., Mermont Plaza, Bryn Mawr, Pa.
1932. McCahey, James F., 1534 Pine St.
1900. McCarthy, Daniel J., 2025 Walnut St.
1936. McCarthy, Patrick A., Central Medical Bldg.
1935. *McClenahan, William U., Edann Road, North Hills, Pa.
1931. McCloskey, Edward, 7 E. Chestnut Ave., Chestnut Hill.
1942. McCloskey, John F., 8720 Germantown Ave.
1935. McConnell, James W., 20th and Chestnut Sts.
1934. McCouch, Grayson P., Medical School, Univ. of Pa.
1938. McCrea, Lowrain E., 1930 Chestnut St.
1937. McCutcheon, Morton, Alden Park Manor, Germantown.
1942. *McDonald, P. Robb.
1895. McFarland, Joseph, 542 W. Hortter St., Germantown.
1937. *McGuinness, Aims C.
1940. *McLaughlin, Edward F.
1933. *McLaughlin, James S.
1924. McMillan, Thomas M., 2044 Locust St.
1924. McPhedran, F. Maurice, Germantown Hosp., Penn and Chew Sts.
1943. Macfarlan, Douglas, 1805 Chestnut St.
1932. Macfarlane, Catharine, 136 S. 16 St.
1910. Mackinney, William H., 1930 Chestnut St.
1936. MacMurtrie, Wm. J., 912 S. 49th St.
1939. Macneill, Norman M., 5116 N. 5th St.
1935. Maeder, LeRoy M. A., 13th and Chancellor Sts.
1935. Maier, Ernest G., 1323 N. 15th St.
1914. Maier, F. Hurst, Wood-Norton Apts., Johnson and Wayne, Germantown.
1942. *Manges, Lewis C., Jr.
1936. Mann, Bernard, 2019 Pine St.

* On active service.

1937. Margolies, Alexander, 1836 Delancey St.
1941. Martin, James R., 136 S. 16 St.
1935. *Mason, James B.
1935. Matthews, Robert A., 111 N. 49th St.
1939. May, Hans, 5501 Greene St.
1932. Meade, Richard H., Jr.
1934. *Mecray, Paul M.
1914. Mencke, J. Bernhard, 1816 Spruce St.
1941. *Mendell, Theodore H.
1937. Meyer, George Phillip, 410 Haddon Ave., Camden, N. J.
1935. Miller, Ford A., 4016 Chestnut St.
1934. Miller, Hugh McCauley, 1614 Locust St.
1939. Miller, Malcolm W., 2021 W. Girard Ave.
1939. Miller, Merle M., 6013 Greene St.
1932. Miller, M. Valentine, 114 W. Phil-Ellena St.
1921. Miller, T. Grier, Univ. of Pa. Hospital.
1937. Missett, Joseph Vincent, Jr., 1814 Spruce St.
1904. Mitchell, Charles Franklin, 2003 Pine St.
1932. Mohler, Roy W., 1806 Spruce St.
1936. *Montgomery, Hugh.
1936. Montgomery, John B., 1930 Chestnut St.
1932. Montgomery, Thaddeus L., 2031 Locust St.
1928. Moon, Virgil H., Jefferson Medical College.
1935. Moore, John Royal, Beury Bldg., Broad St. and Erie Ave.
1924. Moorhead, Stirling W., 1523 Pine St.
1936. *Morgan, David R.
1886. Morris, Caspar, Haverford, Pa.
1893. Morris, Elliston J., 225 Upland Way, Wayne, Pa.
1941. *Mucklé, Craig Wright.
1929. Mudd, Stuart, Department of Bacteriology, Medical School, Univ. of Pa.
1935. Mullen, Carroll Richard, 2025 Locust St.
1934. *Mullen, Edward A.
1905. Muller, George P., 1930 Spruce St.
1930. Murphy, Douglas P., 3722 Chestnut Street.
1934. Murphy, Eugene C., 1841 S. Broad St.
1905. Mutschler, Louis H., 1625 Spruce St.
1936. Nelson, Guy M., 255 S. 17th St.
1905. Newcomet, William S., 3501 Baring St.
1938. Newton, Zachariah B., 7109 McCallum St., Mt. Airy.
1935. *Nicholson, Jesse Thompson.
1899. Nicholson, William Rufus, 2023 Spruce St.
1941. Nisbet, Verner, 254 S. 45th St.
1905. Norris, Charles C., Darby and Goshen Roads, Bryn Mawr, Pa.
1938. *Norris, Robert F.
1941. *North, John Paul.
1933. Nylin, Josef B., Univ. of Pa. Hospital.
1941. Odenatt, Wm. Burrill, 1213 W. Lehigh Ave.
1913. O'Neal, Alexander Hay, St. Davids, Pa.
1936. *Orr, Theodore E.
1913. Outerbridge, George W., 1927 Spruce St.
1915. Owen, Hubley R., 319 S. 16th St.

* On active service.

1897. Packard, Francis R., 304 S. 19th St.
1933. Palmer, Harold Dean, 111 N. 49th St.
1909. Parish, Benjamin Dores, 1927 Spruce St.
1940. *Parker, Alan P.
1931. Paul, John Davis, 3112 N. Broad St.
1932. Payne, Franklin L., Univ. of Pa. Hospital.
1922. Pelouze, P. S., 1737 Chestnut St.
1909. Pemberton, Ralph, Paoli, Pa.
1930. Pendergrass, Eugene P., Univ. of Pa. Hospital.
1932. Pennell, Howard Y., West Chester, Pa.
1939. *Pepper, D. Sergeant.
1914. Pepper, O. H. Perry, Univ. of Pa. Hospital.
1902. Pepper, William, School of Medicine, Univ. of Pa.
1916. Percival, Milton Fraser, 2332 S. Broad St.
1942. Perkins, William Harvey, 1025 Walnut St.
1940. Pessel, Johannes F., Mahlon Drive, Yardley, Pa.
1937. *Pettit, Horace.
1905. Pfahler, George E., 1930 Chestnut St.
1915. Pfeiffer, Damon B., Meadowbrook, Pa.
1935. Phillips, Arthur W., 3904 Walnut St.
1911. Piersol, George Morris, 2031 Locust St.
1933. *Pillsbury, Donald M.
1905. Pitfield, Robert L., 5211 Wayne Ave.
1922. Pleasants, Henry, Jr., West Chester, Pa.
1937. Polk, David Stewart, Rosemont, Pa.
1932. Porter, Roland De Lance, Jenkintown, Pa.
1931. Pryor, Charles Allen, 1910 Spruce St.
1931. Ramsey, Frank M., Chestnut Hill.
1913. Randall, Alexander, 136 S. 16 Street.
1941. Rankin, Charles A., Ludlow & Heather Rd., Upper Darby, Pa.
1926. *Ravdin, I. S.
1941. Rea, Marion Hague, 141 Montgomery Ave., Bala-Cynwyd, Pa.
1938. *Read, Hilton Shreve.
1928. Reese, Warren S., 1901 Walnut St.
1925. Reeves, Rufus S., 2227 Spruce St.
1920. Rehfuss, Martin E., 131 St. George's Rd., Ardmore, Pa.
1921. Reiff, E. Paul, 1927 Spruce St.
1937. Reimann, Hobert A., Jefferson Hospital.
1919. Reimann, Stanley P., The Lankenau Hospital Research Institute, Girard and Corinthian Aves.
1929. de Rényi, George S., 212 S. 39th St.
1923. Repplier, Sidney J., 373 Roumfort Rd., Mt. Airy.
1936. Richards, James L., Haverford Villa, Ardmore, Pa.
1919. Richardson, Russell, 320 S. 16th St.
1919. Ridpath, Robert F., 1737 Chestnut St.
1942. Riggs, Helena E., 37 S. 20th St.
1936. Ritter, Joseph A., 2405 N. 54th St.
1933. de Rivas, Damaso, 1831 Chestnut St.
1942. Rivers, Thurston D., 111 N. 49th St.
1932. *Robbins, Frederick R.
1939. Roberts, Ella, 133 S. 36th St.
1899. Roberts, Walter, 1921 Spruce St.

* On active service.

1932. *Robertson, Harold F.
1903. Robertson, William Egbert, 327 S. 17th St.
1938. Roche, Philip Q., 255 S. 17th St.
1912. Rodman, John Stewart, 1726 Spruce St.
1934. Rogers, Harry L., Riverton, N. J.
1928. Rose, Edward, Univ. of Pa. Hospital.
1936. Rose, Elizabeth Kirk, 426 Owen Rd., Wynnewood, Pa.
1909. Rosenberger, Randle C., Rahns, Pa.
1932. Rothrock, Harry A., West Chester, Pa.
1936. Rothschild, Norman, 245 S. 16th St.
1933. *Rowntree, Leonard George.
1937. Roxby, John B., Dept. of Anatomy, Temple University.
1941. *Royster, Hubert A., Jr.
1933. Rudolphy, Jay Besson, 230 S. 21st St.
1929. Ryan, William J., 136 S. 16th St.
1936. Sands, Joseph Evans, Rosemont, Pa.
1905. Sartain, Paul J., 2006 Walnut St.
1908. Sautter, Albert C., Germantown Professional Bldg.
1927. Saxon, Gordon J., 5314 Spruce St.
1920. Scarlett, Hunter W., 230 S. 21st St.
1939. Scattergood, Joseph, Jr., 115 S. High St., West Chester, Pa.
1917. Schaeffer, J. Parsons, 4634 Spruce St.
1929. Scheffey, Lewis C., 255 S. 17th St.
1942. *Scheie, Harold G.
1929. *Schenck, Harry P.
1917. Schnabel, Truman G., 1704 Pine St.
1917. Schoff, Charles H., Media, Pa.
1928. *Schofield, Frederick S.
1921. Schumann, Edward A., 1814 Spruce St.
1930. Scott, John Porter, 1740 Bainbridge St., The Children's Hospital.
1940. *Scott, T. F. McNair.
1924. Shallow, Thomas A., 1611 Spruce St.
1908. Shannon, Charles E. G., 1930 Chestnut St.
1928. Sharpe, John S., Haverford, Pa.
1928. Sharpless, Frederick C., Rosemont, Pa.
1897. Sharpless, William T., West Chester, Pa.
1931. *Sheehan, William C.
1932. Sheridan, Joyce T., 412 W. Durham St.
1943. Shewbrooks, Daniel M., Penn Mutual Life Ins. Co., 6th and Walnut Sts.
1906. Shields, William G., 414 School Lane, Germantown.
1936. Shipman, James Shelby, 255 S. 17th St.
1935. *Shoemaker, Robert, 3rd.
1939. *Shumway, Norman P.
1936. Shuster, Benjamin H., 1824 Pine St.
1941. *Silcox, Louis E.
1903. Sinclair, John F., 4103 Walnut St.
1907. Sinkler, Francis W., 136 S. 16th St.
1928. Skillern, Samuel R., 1734 Pine St.
1933. Smelzer, Donald Campbell, Germantown Hosp., Penn and Chew Sts.
1929. *Smith, Austin T.
1933. Smith, Lauren Howe, 111 N. 49th St.

* On active service.

1937. Smith, Lawrence Weld, Temple School of Medicine.
1936. Smith, Richard Manges, 4727 Oakland St.
1927. Smyth, Calvin Mason, Room 451, Methodist Hospital, Broad and Wolf Sts.
1941. Snyder, G. Gordon, Mermont Apts., Bryn Mawr, Pa.
1935. Sokoloff, Martin J., 255 S. 17th St., Phila.
1940. Soloff, Louis A., 2032 Pine St.
1935. Sommer, George N. J., 120 W. State St., Trenton, N. J.
1928. Spaeth, Edmund B., 1930 Chestnut St.
1937. Spangler, John Luther, Devon, Pa.
1935. Spiegel, Ernest, 6807 Lawnton Ave., Oak Lane.
1929. Sponsler, Marshall B., 1737 Chestnut St.
1894. Stahl, B. Franklin, Haverford, Pa.
1909. Starbuck, J. Clinton, 42 East Washington St., Media, Pa.
1927. Starr, Isaac, 505 Cresheim Valley Rd.
1936. Steinfield, Edward, N.E. Cor. 18th and Chestnut Sts.
1942. *Stengel, Alfred, Jr.
1901. Stevens, Arthur A., 314 S. 16th St.
1914. Stewart, Thomas S., The Barclay, 18th and Rittenhouse Sq.
1941. Stewart, Winifred B., 2028 Delancey St.
1931. *Stiles, Merritt H.
1934. Stimson, Cheney M., 167 Harvey St., Germantown.
1925. Stokes, John H., 4228 Spruce St.
1928. Stokes, Joseph, Jr., 1740 Bainbridge St.
1923. Strecker, Edward A., 111 N. 49th St.
1923. Stroud, William Daniel, 1011 Clinton St.
1937. Strumia, Max M., Bryn Mawr Hospital, Bryn Mawr, Pa.
1933. Stuckert, Harry, 248 S. 21st St.
1937. Sturgis, Margaret C., 1930 Chestnut St.
1927. Sturgis, Samuel Booth, 34 W. Montgomery Ave., Ardmore, Pa.
1934. Summey, Thomas J., 255 S. 17 St.
1930. Sunderman, F. William, 2210 Delancey St.
1936. Surver, James Miller, 1832 Spruce St.
1928. Swartley, William B., 6002 Greene St.
1934. Sweeney, John A., 1900 Rittenhouse Sq.
1943. Tassman, Isaac S., 136 S. 16th St.
1933. Taylor, Herbert W., Haverford, Pa.
1931. Taylor, Norman H., 100 W. Evergreen Ave.
1928. Thomas, J. Earl, Drexel Hill, Pa.
1907. Thomas, T. Turner, 1636 Francis St.
1942. *Thompson, Wesley, D., Jr., Lovell General Hospital, Fort Devens, Mass.
1927. Thorington, J. Monroe, 2031 Chestnut St.
1898. Thornton, Edward Q., 1331 Pine St.
1936. Thornton, Mary Bickings-, 2703 West Somerset St.
1936. Thorp, Francis Quicksall, 4900 Penn St.
1936. Thudium, William J., 136 S. 16 St.
1935. Tocantins, Leandro Maués, 45 Woodale Rd.
1935. Toland, Owen J., Episcopal Hospital, Front and Lehigh Ave.
1941. Tompkins, Pendleton, 255 S. 17th St.
1936. Towson, Charles Emory, Germantown Professional Bldg., Phila.
1908. Tracy, Stephen E., 1930 Chestnut St.
1926. Tucker, Gabriel, 326 S. 19th St.

* On active service.

1938. Tuft, Louis, 1530 Locust St.
1933. Tumen, Henry J., 1900 Rittenhouse Sq.
1938. Turman, Christopher M., Wyncote, Pa.
1935. Turnbull, William G., Phila. General Hospital.
1923. Turner, Creighton H., 1731 Pine St.
1929. Tyson, Ralph M., 255 S. 17th St.
1937. *Uhle, Charles A. W.
1907. Ullom, Josephus T., Carpenter and Quincy Sts.
1934. Ulrich, George A., 309 S. 12th St.
1937. *Vander Veer, Joseph B.
1937. Van Loon, Emily Lois, 1930 Chestnut St.
1933. Vastine, Jacob H. 2nd, 136 S. 16 St.
1912. Vaux, Norris Wistar, 807 Spruce St.
1940. Voegelin, Adrian W., 1521 Lindley Ave.
1941. *Vogel, Stoughton R.
1903. Wadsworth, William S., 3914 Baltimore Ave.
1927. Wagers, Arthur J., 1429 Spruce St.
1928. *Wagoner, George W.
1938. *Waldman, Joseph.
1906. Walker, John K., Media, Pa.
1907. Walker, Warren, 1819 Chestnut St.
1932. Walkling, Adolph A., 136 S. 16 St.
1904. Walsh, Joseph, 136 S. 16 St.
1895. Watson, Arthur W., 2013 Locust St.
1932. Watt, Charles C., Jr., 6605 Wayne Ave.
1933. Waygood, James Jamison, 3464 School Lane.
1941. Weaver, Ruth H., 1719 Rittenhouse Square.
1930. Weeder, S. Dana., 6110 Greene St.
1920. Weidman, Fred D., 20 Tenby Rd., Llanerch, Pa.
1933. Weiss, Benjamin P., The Lenox, 13th and Spruce Sts.
1923. Weiss, Edward, 269 S. 19th St.
1935. Whelan, G. L., 2100 Walnut St.
1921. Whitaker, William, 6771 Germantown Ave.
1936. White, Ellen Pawling Corson-, 1820 Pine St.
1925. Widmann, Bernard P., 250 S. 18th St.
1936. Wilder, Theodore S., Germantown Professional Bldg., Greene and Coulter Sts.
1914. Willard, De Forest P., 1726 Spruce St.
1935. *Willard, John Harrington.
1939. Willauer, George, 1930 Chestnut St.
1907. Williams, Carl, School Lane and Greene St.
1924. Williams, Horace James, 5908 Greene St., Germantown.
1937. Williams, John C., 6370 Germantown Ave.
1920. Williams, Philip F., 2206 Locust St.
1927. Williamson, Ernest G., 6353 Woodbine Ave.
1921. Wilson, George, 133 S. 36th St.
1942. Wilson, Lucius R., 1305 Morris Road, Wynnewood, Pa.
1937. Wilson, Ross B., 1820 S. Rittenhouse Sq.
1902. Wilson, Samuel M., 1930 Chestnut St.
1897. Wilson, W. Reynolds, Villa Nova, Pa.
1940. *Winchell, A. Vaughn.
1941. *Wirts, C. Wilmer.

* On active service.

1904. Wister, James W., 5430 Germantown Ave.
1933. Wohl, Michael G., 1727 Pine St.
1918. Wolferth, Charles C., 26 Raynham Rd., Merion, Pa.
1942. Wolman, Irving J., Children's Hospital, 1740 Bainbridge St.
1893. Wood, Alfred C., 2035 Walnut St.
1932. *Wood, Francis C.
1900. Wood, George B., N.E. Corner 20th and Chestnut Sts.
1903. Wood, Horatio C., 319 S. 41st St.
1897. Woodward, George, W. Willow Grove Ave., Chestnut Hill.
1928. Wright, Carroll S., 1402 Spruce St.
1937. Yaskin, Joseph C., 1832 Spruce St.
1941. Young, Barton R., 8327 Roberts Road, Elkins Park, Pa.
1894. Zentmayer, William, 1930 Chestnut St.
1933. Zulick, J. Donald, 2008 Walnut St.

Non-Resident Fellows

ELECTED

1903. Biggs, M. H., Rutherfordton, N. C.
1937. *Braceland, Francis J.
1936. Brown, Clark E., Dept. Pathology, University of N. Carolina, Chapel Hill, N. C.
1908. Cadbury, William W., 260 E. Main St., Moorestown, N. J.
1936. Camero, Anthony R., 657 S. Westlake Ave., Los Angeles, Cal.
1936. Clarke, Francis Mann, 116 New St., New Brunswick, N. J.
1937. Conaway, W. P., 1723 Pacific Ave., Atlantic City, N. J.
1936. *Cooper, Melbourne J.
1897. Dorland, W. A. Newman, 1236 N. Dearborn Parkway, Chicago, Ill.
1905. Evans, Joseph S., Jr., 1300 University Ave., Madison, Wis.
1933. Fowler, Kenneth, 2535 Horton Ave., San Diego, Cal.
1935. Fretz, John Edgar, "Hillcrest" College Hill, Easton, Pa.
1913. Gates, Nathaniel, 10 Peterboro, Detroit, Mich.
1936. Guthrie, Donald, 118 S. Wilbur Ave., Sayre, Pa.
1902. Gwyn, Norman B., 109 Madison Ave., Toronto, Canada.
1928. *Hayman, Joseph Marchant, Jr.
1892. Hinsdale, Guy, Lewisburg, West Virginia.
1933. Hitzrot, Lewis H., Medical Director, Mercersburg Academy, Mercersburg, Pa.
1936. Hughes, Brady A., 5005 42d Place, North, Birmingham, Ala.
1899. Jopson, John H., Waverly Mills, S. C.
1931. Kinney, Willard H., 7300 Atlantic Ave., Ventnor, N. J.
1935. McGuire, Hunter H., 105 N. Braddock St., Winchester, Va.
1900. McReynolds, Robert Phillips, 213 S. Broadway, Los Angeles, Cal.
1936. *Middleton, William Shainline.
1915. Musser, John H., 1430 Tulane Ave., New Orleans, La.
1937. Nicholson, Samuel T., 2d, The Hill School, Pottstown, Pa.
1905. Norris, George W., Dimock, Pa.
1899. Parke, Wm. E., 5637 LaGorce Drive, Miami Beach, Florida.
1926. Paul, John Rodman, Dept. Internal Medicine, Yale University, New Haven, Conn.
1907. Price, George E., Stimson Bldg., Seattle, Wash.
1904. Ravenel, M. P., 203 Westmont Ave., Columbia, Mo.
1936. Reisinger, John A., 7500 Bybrook Lane, Chevy Chase, Md.

* On active service.

1907. Royer, B. Franklin, The Hall, R. D. 7, Chambersburg, Pa.
1913. de Schweinitz, George L., 85 E. Broad St., Bethlehem, Pa.
1941. *Shands, Alfred R., Jr.
1908. Shoemaker, Harlan, 1930 Wilshire Blvd., Los Angeles, California.
1932. Siegel, Alvin Erdreich, Medical Arts Building, Macon, Ga.
1934. *Stewart, Sloan G.
1900. Swan, John M., 457 Park Ave., Rochester, N. Y.
1930. Thorpe, Edward S., Jr., Medical Director, St. Paul's School, Concord, N. H.
1913. Vail, William Penn, Blairstown, N. J.
1897. Veasey, Clarence Archibald, 1569 Paulsen Medical and Dental Bldg., Spokane, Washington.
1931. Walker, Herschel Carey, 320 Park Ave., New York City, N. Y.
1903. Weber, Charles H., 3 Arch Bay, Laguna Beach, California.

Honorary Fellows

Limited to Fifty, of Whom Twenty May be Foreigners

American

ELECTED

1917. Miner, Charles Howard, b.s., m.d., Member of Board of Directors, Wilkes-Barre General Hospital; Board of Health, Wilkes-Barre; Board of Directors, White Haven Sanitarium Association and Penna. Tuberculosis Society. 264 S. Franklin St., Wilkes-Barre, Pa.
1936. Richards, Alfred Newton, ph.d., sc.d., m.d. (hon.), l.l.d., Professor of Pharmacology, School of Medicine, Vice-president in charge of Medical Affairs, Univ. of Pa. School of Medicine, Univ. of Pa., Phila.
1942. Russell, Frederick Fuller, m.d., Brig. Gen. Med. Corps, U. S. A. (Ret.). Harvard Medical School, Boston, Mass.

Foreign

1928. Archibald, Edward, m.d., Col., r.c.a., m.c., H. O. Med. Services, Elgin Bldg., Ottawa, Ontario.
1937. Dale, Sir Henry Hallett, c.b.e., f.r.s., m.a., m.d., f.r.c.p., Director, National Institute for Medical Research, Hampstead, Eng. Mt. Vernon House, N.W. 3, Hampstead, London.
1924. Hopkins, Sir F. Gowland, m.d., Biochemical Department, University of Cambridge, Cambridge, England.
1922. McCarrison, Sir Robert, k.t., c.i.e., m.d., d.sc., ll.d., f.r.c.p., Major-General, Indian Medical Service (retired). 18 Linton Rd., Oxford, England.
1928. Rolleston, Sir Humphrey, bart., g.c.v.o., k.c.b., m.d., d.c.l. (*Durh.*), ll.d., d.sc., Martins, Haslemere, Surrey, England.

Honorary Associates

1942. Conklin, Professor Edwin G., Princeton University, Princeton, N. J.
1942. Donner, William Henry, Lincoln-Liberty Bldg., Philadelphia, Pa.

Necrological List

Resident Fellows

	Date of Election	*Date of Death*
J. Alexander Clarke	January, 1926	January 31, 1943
Curtis C. Eves	November, 1912	September 22, 1942
Robert G. Gamble	May, 1899	March 12, 1943

* On active service.

RESIDENT FELLOWS—*Concluded*

	Date of Election	*Date of Death*
H. LEON JAMESON	June, 1922	July 1, 1942
FRANCIS JOSEPH KELLY	October, 1913	September 3, 1942
WILMER KRUSEN	March, 1900	February 9, 1943
WILLARD G. MENGEL	January, 1940	January 28, 1943
LUTHER C. PETER	October, 1917	November 13, 1942
ROBERT L. PITFIELD	February, 1905	October 3, 1942
JAMES TORRANCE RUGH	February, 1905	October 12, 1942
HOWARD W. SCHAFFER	May, 1932	February 11, 1943
CHARLES A. SERVICE	November, 1917	June 23, 1942
WILLIAM G. SHIELDS	May, 1906	July 11, 1942
WILLIAM T. SHOEMAKER	December, 1896	November 26, 1942
MARTHA TRACY	May, 1934	March 22, 1942
R. POWERS WILKINSON	March, 1936	December 2, 1942
HARRY B. WILMER	October, 1916	January 16, 1943

NON-RESIDENT FELLOWS

JOHN W. HUNTER	October, 1912	June 22, 1942
EDWARD JACKSON	November, 1885	October 29, 1942
HOWARD A. KELLY	May, 1887	January 12, 1943
VARNUM C. SOUTHWORTH	January, 1933	February 9, 1943

HONORARY FELLOW—AMERICAN

GEORGE W. CRILE	November, 1909	January 7, 1943

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Some Physiological Problems of Aviation*

By CARL F. SCHMIDT, M.D.

Professor of Pharmacology, University of Pennsylvania

UNTIL the outbreak of the present World War most of the medical profession—myself included—were only dimly aware of the enormous strides that had been made by the aviation industry toward improving the performance of aircraft, and were quite unaware of the challenge which those developments presented to them. The astounding military successes of the Germans in Poland, the Low Countries and France, however, showed in the most dramatic way what control of the air can accomplish in modern warfare, led to the unpleasant realization that this country lay completely defenseless against air attack, and caused many of us to inquire into the steps necessary for us to secure an adequate air force of our own. Until then all but a handful in this country had taken it for granted that the development of air power superior to that of the Germans involved nothing more than the designing and building of airplanes superior to theirs in quality as well as quantity—that the problem was one for the engineers and industrialists, with the medical profession no more involved than in any other form of warfare. Fortunately there appeared in the summer of 1939 a book on aviation medicine by Captain Harry G. Armstrong (1), one of a small group who had been doing research along those lines in this country. This book contained information—already familiar to the numerous students of these problems in Germany and the few in this country but entirely unknown to most people—which indicated very clearly that the engineers had already provided us with airplanes capable of greater speed, maneuverability, altitude and range than human beings could tolerate without dangerous or fatal consequences. Many of us then realized for the first time that there were inexorable physiological limitations to further improvement in the performance of aircraft and that if we were even to equal German air power it would be necessary for us to equal their success in identifying these limitations and in devising measures intended to overcome them. Later the same year a German publication on aviation medicine also appeared (10) and the long start which the Germans had in these efforts was forcibly brought home. It now seems probable that a large part of the early success of the Luftwaffe was due to an intimate and effective association between medical research groups on the one hand, and the engineers and the flight training groups on the other—an association that has already been brought about in England and Canada and now is well forward in this country.

Realization of the existence and potential significance of these physiological limitations constituted a challenge to all whose activities were at all related to them. Each individual naturally evaluated them and formulated an attack upon them in terms of his own interests. In my own case these were the regulation of respiration and the cerebral

*Mary Scott Newbold Lecture LIII, The College of Physicians of Philadelphia, April 7, 1943.

circulation, both of which happen to be intimately concerned with the stresses of aviation. What we have done, are doing, and hope to do in this connection I am not at liberty to divulge. There can be no objection, however, to outlining briefly some of the facts which led us to conclude nearly three years ago that one of the most important tasks confronting the medical profession in the world as now constituted is to assist the aviation engineers and the aviation training and maintenance groups in strengthening flight personnel against the unprecedented stresses that are inflicted upon them under conditions of current military aeronautics.

I. PROBLEMS RELATED TO ALTITUDE

As man ascends above the surface of the earth he is exposed to progressive diminutions in both the pressure and the temperature of the ambient atmosphere. The former gives rise to two distinct sets of problems, those referable to oxygen-lack, and those due to the decompression *per se*.

1. Oxygen-lack. The existence of anoxia at high altitudes is probably the best known fact about the physiology of aviation. Since the percentage of oxygen in the atmosphere remains constant while the total atmospheric pressure decreases with the ascent, the number of oxygen molecules taken into the lungs in a given volume of air also decreases correspondingly. Up to 8000 feet usually no effects are discernible except a slight to moderate acceleration of the pulse, but above that so-called safe zone symptoms of anoxia are likely to begin. The most important of these have to do with the central nervous system, the effects of anoxia upon which are very similar in all essential respects to those of alcohol, with the addition of hyperpnea and tachycardia. The flyer under the influence of anoxia is as incapable of intelligent action and effective psychomotor coordination as the motorist under the influence of alcohol and is equally unaware of his shortcomings. Current regulations in our armed forces and in commercial airlines make the use of oxygen mandatory at altitudes of 10,000 feet or above, but many experienced flyers have learned that they suffer less fatigue after the flight if they use oxygen even at lower altitudes. Subacute or chronic anoxia thus takes the form of fatigue here as it has long been known to do elsewhere (6) (13).

At 18,000 feet the atmospheric pressure is only half that at sea level but most healthy persons can get along quite well at this altitude without oxygen if they remain quiet. Deterioration in sensory perceptions and in psychomotor coordination can usually be detected by suitable tests but exact information is difficult to obtain because if the test is relatively simple the subject probably can concentrate temporarily and spurt to a normal score, while if the test is more complicated the factor of learning becomes a major consideration. Above 20,000 feet deterioration is usually rapid and most subjects become unconscious below 25,000 feet. The symptoms preceding loss of consciousness are not at all unpleasant, for sensory perceptions are blunted quite early. As Armstrong points out (1), there is no other condition in which so extensive and dangerous deviations from normal occur with so little warning of their presence.

When oxygen is inhaled by the apparatus now being installed in our military aircraft, the flyer can retain a normal sea level arterial oxygen saturation up to approximately 35,000 feet. Above that level anoxemia begins to develop even though the equipment is functioning perfectly. This is because the flyer's lungs contain carbon dioxide and water vapor in addition to oxygen, and the tensions of the former gases, being determined by metabolic processes rather than the environment, remain substantially unchanged as the ambient pressure decreases. Under such circumstances the carbon dioxide and water vapor expand like any gas when the pressure under which it is held is decreased, with the result that they occupy a proportionately greater fraction of the total air-bearing space. Thus at 40 mm. Hg for the alveolar pressure of carbon dioxide and 47 mm. Hg for the pressure of water vapor, their sum (87 mm. Hg) would represent only 11.4 per cent of the total gaseous contents of the lungs at sea level (760 mm. Hg), 25 per cent at 20,000 feet (349 mm. Hg), 62 per cent at 40,000 feet (141 mm. Hg) and more than 99 per cent at 50,000 feet (87.3 mm. Hg). Fifty thousand feet would therefore be the absolute ceiling for flight with ordinary oxygen equipment, since the flyer then would have no oxygen at all in his lungs even if he breathed 100 per cent oxygen as deeply as he could. The actual ceiling is of course lower than this; the accepted altitude record for an airplane without special oxygen inhaling equipment is about 47,000 feet, and the useful ceiling for military airplanes is probably below 40,000 feet. This is not because the planes are incapable of going higher but solely because the flyers are likely to become anoxic at higher alti-

tudes even if all the oxygen equipment is functioning perfectly. It goes without saying that the small leaks or other mishaps that are always likely to occur will lower the ceiling or reduce the margin of safety.

It is possible to go higher than this either by decreasing the alveolar tensions of carbon dioxide and water vapor, or by increasing the alveolar tension of oxygen. Alveolar carbon dioxide tension can be lowered by overventilation or by increasing the acidity of the arterial blood, but neither procedure has proved to have any practical value, and effective diminution in alveolar water vapor tension has not yet been reported. The only practical methods have to do with increasing the tension of oxygen in the alveolar air, and this can be done either by compressing the air in the cabin of the plane (the so-called pressurized or supercharged cabin airplane) or by building up a pressure inside the individual flyer's helmet (pressurized suits). Our Air Force (1) as well as the Germans and the French are known to have had pressurized cabin planes several years ago and it is probable that all the major belligerents are still experimenting with such devices. Major engineering difficulties appear to have been encountered and in the recent emphasis on maximum production of current models further developments along these lines seem to have suffered. Pressurized suits have been avilable for some years; the world's altitude record for heavier-than-air craft actually was set in 1935 by a British crew so equipped. The fact that the R.A.F. have not used this equipment although its practicability had been demonstrated, seems to indicate that here too practical obstacles have been encountered. It is no secret that either device interferes with the military value of the plane—the pressurized cabin because it necessarily means an increase in weight, which detracts from the speed, range, or useful load of the plane, the pressure suit because its helmet interferes with the flyer's vision and its inflated sleeves and legs make his movements more difficult. Another objection to either device is the danger of sudden leakage or bursting at an altitude higher than 40,000 feet, for if that occurs the flyer may not be able to reach a friendlier environment before he succumbs to the combined effects of anoxia, cold, and decompression sickness (see below). Armstrong (1, page 321) wrote in 1939: "In no instance should anyone ever be allowed to fly above 40,000 feet." Within the past few months reports have appeared in the newspapers of German observation planes being shot down by British pursuit craft at altitudes considerably higher than this. If the claimed altitudes are accepted, the progress of military aviation in the past few years is graphically illustrated. Yet it is still true that flight at altitudes higher than 40,000 feet is an extremely hazardous procedure, to be undertaken only if the probable gain is thought to outweigh the greatly increased risks. Planes are now available which can attain these altitudes; the shortcomings lie in the flyers and these must be overcome more successfully than has been the case hitherto if flight at very high altitudes is to be practised more extensively.

So far this discussion of the anoxia problem in aviation has dealt solely with improvement in the supply of oxygen to the flyer. When it is recalled that the central nervous system is the most susceptible of all body tissues to the depressant influence of anoxia (6) (13), the possibility at once becomes evident that the flyer's performance, even in the presence of considerable anoxemia, might be improved if the cerebral depression could be antagonized. Theoretically this could be done either by means of drugs which increase the activity of nerve cells (such as benzedrine or caffeine), or by means of agents which improve the utilization of oxygen by these cells (such as the components of the vitamin B complex, or adrenal cortical extracts). It has proved to be extremely difficult to obtain unambiguous evidence as to the degree, or indeed the existence of improvement in a man's altitude tolerance under the influence of agents such as these. This is because the only really unequivocal end-point (death or survival), even if it could be used in experiments on man (which is of course out of the question), does not necessarily furnish any criterion of the influence of the same agent at more reasonable altitudes. Various tests have been devised for estimating the deterioration of central nervous functions of man under anoxia, and for studying the influence of drugs, hormones, and vitamins upon it, but the results are of limited value unless three factors are constantly kept in mind: spontaneous variations in a given individual's responses, temporary concentration (spurting), and training. The number of observations required to obtain statistically significant results in a sufficient number of subjects, in the face of these confusing variables, is so great that work of this nature becomes a formidable

undertaking. At present the general belief in this country appears to be that it is better to concentrate energy on measures intended to improve the flyer's environment (in this case his alveolar oxygen tension) than to expend considerable effort in studies of the effects (beneficial or otherwise) of agents which are supposed to alter his reactions to an abnormal environment. The same belief apparently is held in Germany (10). So far no evidence has been presented to indicate that any of these agents can be counted upon to improve the altitude tolerance of aviators, and the opinion seems to be growing that no very effective agent or procedure is likely to be discovered. Undesired side actions are always to be dreaded. The case of pervitin, one of the drugs that has been most widely advocated and tested in Germany and in this country, is probably typical: the available evidence indicates that it may facilitate concentration on a given task and decrease sensations of fatigue, but it does so at the expense of the body's reserves and will necessitate a long recovery period (8).

2. Decompression sickness. The decrease in ambient pressure during ascent in aircraft has other effects than those due to anoxia. Expansion of the air trapped in the middle ear and pneumatic sinuses may cause discomfort or actual pain, and a similar event in a gas-containing tooth may cause toothache. If a closed pneumothorax is present the lung will collapse further as the pressure in the pulmonary alveoli falls during the ascent. Gas in the intestinal tract also expands and considerable abdominal distention may ensue if air-containing foods such as beans, peas, and other vegetables had been ingested shortly before the ascent. This gas is usually voided by belching or as flatus and no great difficulty is encountered from it.

These are normal consequences of decompression and are not usually included under the category of decompression sickness. The cause of the latter is thought to be the same as that of the "bends" in divers and caisson workers, viz. formation of nitrogen bubbles in the tissues. The symptoms may take one of several forms, the mildest of which is the appearance of cutaneous paresthesias (itching, formication, or sensations of cold or heat), sometimes associated with skin eruptions. Next would be the "bends," meaning discomfort or actual pain in one or more joints, usually the shoulders, elbows, or knees, and this may progress in severity until it becomes unbearable. Still another and more severe form is the "chokes," meaning cough, dyspnea and substernal pain rapidly progressing to collapse.

The critical altitude for the appearance of these symptoms is about 30,000 feet, below which they are rarely encountered but above which they become increasingly more frequent and severe as the altitude increases and as the duration of exposure becomes longer. The symptoms are thought to be due to accumulation of nitrogen bubbles in the tissues and are therefore fully analogous to the "bends" in divers and caissoniers. This is to be expected since the flyer at 33,000 feet is exposed to a barometric pressure only one-fourth that at sea level and has therefore been decompressed in the ratio of four to one during his ascent —a situation comparable with that encountered by a diver coming to the surface after a sojourn at a depth of 100 feet in salt water, at which he was exposed to a total pressure of four atmospheres. The similarity with "bends" in divers extends to the prompt relief conferred by recompression (secured by a descent to a lower altitude in the case of the flyer), to prevention by denitrogenation through inhalation of oxygen before the flight, and to a time factor, for in both cases the symptoms do not come on immediately on decompression but are increasingly likely to occur as the exposure to the lower pressure is continued. It is noteworthy that the symptoms of decompression sickness are quite distinct from those of anoxia and are not relieved by oxygen inhalation once they have developed—a self-evident fact since they only occur at altitudes which a flyer cannot reach without breathing oxygen.

The susceptibility to "bends" and "chokes" varies widely among different individuals, but tends to be somewhat lower in younger persons. Unfortunately for purposes of classifying aviators according to their resistance to altitude sickness, however, this susceptibility appears to vary in the same individual from time to time. Prolonged inhalation of oxygen before ascent will prevent "bends" or "chokes" and briefer inhalation will delay their onset or raise the altitude at which they occur, but practical difficulties of two types arise here. The one has to do with the necessity for keeping flyers continually in readiness, through preliminary oxygen inhalation, to intercept enemy bombers coming over at high altitude. The other is concerned with the possibility of harmful effects from repeated inhalation of oxygen for considerable

periods at sea level, for this has been reported to have caused pulmonary irritation (3) or actual bronchopneumonia (2).

Decompression sickness can be prevented by means of pressurized cabins or pressurized suits. To minimize the pressure differential between the cabin and the environment (and therefore the strain on the former) the pressure inside is not brought to sea level but only to that at which anoxia can be prevented by oxygen inhalation. As noted above, this could be somewhere between the equivalents of 35,000 and 40,000 feet, but these pressures are too low to prevent "bends." Attempts at decreasing the incidence of these symptoms have been made with a number of drugs, so far without any convincing evidence of benefit.

3. Cold. During ascent above the earth's surface the average temperature falls steadily, approximately at the rate of 2° C. (3⅗° F.) for each 1000 feet of ascent, up to an altitude of about 35,000 feet at which it reaches a level of −55° C. (−67° F.) and then remains constant from this altitude upward. According to Armstrong (1), clothing alone will not keep a flyer comfortable when exposed to temperatures lower than +10° F.; at −10° F. vision is restricted by frosting of the goggles; at −20 to −40° F. progressive mental distress, loss of morale, lethargy, and a tendency toward stupor are encountered. Considerable progress has recently been made toward better protection of flight personnel against cold, by the provision both of electrically heated clothing (which is much less bulky than its non-heated equivalent) and of closed, heated cabins. The closed cabins have come into use at least in part because they improve the aerodynamics of the planes and therefore appeal to the engineers. This is not true of electrically heated suits, the energy for which must be derived from the plane's fuel supply, thereby reducing its speed, range, altitude, or useful load correspondingly. Heat from the engines can easily be used to heat radiators in the cabin if liquid cooling is employed, but the air cooled engines used in most of our high-altitude planes do not lend themselves to this procedure. Heat is especially difficult to supply to gunners in turrets and blisters, yet it is here that the exposure to cold is greatest and the opportunity for movement least.

One of the most serious results of cold is the tendency to freezing of expired water vapor in the oxygen masks and tubing. This has been minimized by redesigning the equipment but the discomfort of ice formation in or around the oxygen mask is a problem that can probably be solved only by the application of heat.

II. PROBLEMS RELATED TO MOTION

1. Acceleration. When the direction of an airplane traveling at high speed is suddenly changed centrifugal force comes into play and the effect is the same as though the weight of the dependent contents of the plane had been increased. This force can be measured by a spring or torsion balance and is commonly reported in terms of gravity, or "G". The centrifugal force developed when the plane is turned from level to curved flight is directly proportional to the square of its velocity and inversely proportional to the radius of the curve, or $F = \frac{MV^2}{r}$, where F is the force, M the mass, V the velocity, and r the radius. It follows that both speed and sharpness of turn enter into the end result but the former has the greater influence.

The effect of centrifugal force on the occupant of an airplane is to increase the weight of his body and of all parts of it. At 2 G this simply pushes him into his seat but at 3 to 4 G he finds it difficult to move; at 5 G he may be entirely helpless, his breathing becomes difficult, and his vision may become dim ("gray-out") or may be lost entirely ("blackout"). Further acceleration causes exaggeration of these symptoms; most subjects lose consciousness at 5 to 8 G, there being considerable individual and diurnal variation.

The loss of vision or consciousness is due to acute anemia of the retina and of the brain because of decreased cardiac output, this being due in turn to pooling of blood in the dependent parts of the body. The increase in weight resulting from the centrifugal force affects the blood as well as the other parts of the body and it is the gain in weight of the blood that causes the "blackout." It is estimated (7) that at 7 G the effective weight of the blood is greater than that of molten iron and the heart is incapable of getting it back from the lower limbs. The consequences of these changes on cardiac filling are dramatically illustrated in a series of roentgenograms of the heart of a monkey which was injected with radio-opaque material and then subjected to centrifugal force by whirling it on a centrifuge (10). The heart shadow decreased progressively as the acceleration increased

and practically disappeared at 5.5 G. Carotid blood pressure probably approaches or reaches zero under such circumstances and acute cerebral anemia supervenes.

These phenomena are most familiar in connection with dive bombing but they can be encountered under any other conditions in which the direction of an airplane is rapidly changed while it is moving with sufficient speed. The greater the speed, the slower the turn must be if a "blackout" is to be avoided. Since 5 G is the threshold for this in many individuals, it may be of interest to note the radius of the turn at which a pull of 5 G is developed at different plane speeds. At 200 m.p.h. this is 537 feet, at 300 m.p.h. it is 1208 feet, and at 400 m.p.h. it is 2148 feet. Thus some of the tactical advantage gained by the increased speed must be sacrificed whenever it is necessary to turn the plane, which therefore becomes an easier target than would otherwise be the case. In dive bombing it is customary to open flaps in the wings to slow the dive to a speed at which the pilot can pull out fairly sharply without "blacking out," but this again makes the plane an easier target.

When the plane is turned with the pilot's head outward (so-called negative acceleration) the phenomena are those of acute cerebral congestion, leading to mental confusion and sometimes to red vision ("red-out"). Afterward a severe headache is apt to occur and pilots do not care to repeat the experience. The "blackout" type (positive acceleration), on the other hand, has no unpleasant or dangerous after effects and may be done many times daily during training without known harm.

These phenomena are independent of altitude and temperature and are elicited as well in a closed cabin plane as in an open one. They are not prevented or ameliorated by oxygen and no drugs have yet been proved to have any real value in preventing them. They can however be minimized or prevented by preventing the accumulation of blood in the dependent parts of the body, and this has been done by encasing the flyer in trousers containing water. This has been tried by the Germans (5), the principle being that the increased gravitational pull will cause the water to press inward upon the limbs with the same force with which the blood is pressing outward; the device does not seem to have been used very widely as yet, though it is said (5) to have increased the flyers' tolerance to 15 G, which is more than an airplane will stand without coming apart.

2. Air-sickness. The occupants of an airplane are exposed to the same types of movements which occur in a ship and may develop symptoms identical with those of sea-sickness. In both cases the cause appears to lie mainly in the internal ear (10). The most stable part of the airplane is the forward end of the cabin, the least stable the tips of the wings and the end of the tail. The tail gunner of a bomber therefore is more exposed to air-sickness than the other members of the crew. In a large transport or ambulance plane the men carried near the tail are also likely to develop air-sickness if the flight is at all rough.

Air-sickness with its attendant vomiting is particularly serious when it occurs at altitudes at which oxygen must be used. It is also an important problem in conjunction with the growing use of air transports and air ambulances. In view of the poor results from innumerable attempts to prevent or alleviate sea-sickness in the past, the prospects for effective treatment of air-sickness are not very bright. So little is now known about the nature of the physiological disturbance to be treated here, or about the mode of action of drugs on the vestibular apparatus, that the search for remedies is on a basis of pure trial and error. As in the case of anoxia and bends, the susceptibility of a given subject to air-sickness is apt to vary from day to day, and this makes the evaluation of remedies still more difficult. However, since an effective preventive or cure for air-sickness will almost certainly be useful also for sea-sickness, the problem deserves considerable attention.

This paper does not pretend to contain a complete summary of the physiological problems of aviation. Some of the most important aspects of the subject—the development of tests for the selection of personnel for training, of other tests for the detection of unfitness under operating conditions, the training of medical and other personnel to carry them out, problems related to clothing, oxygen apparatus, emergency equipment, food, and many others—have not even been mentioned. In selecting the material for inclusion here I have been guided more by a desire to make understandable things which appear to be most perplexing to medical men who are not in direct contact with the problems of aviation, than by the actual importance of the topics to the present and future development of aviation medicine. I have avoided reference to the work which our own group has done as a background and foundation for our cur-

rent interest in this field, because it bears only on one aspect of one phase of the subject—the respiratory effects of anoxia—and therefore seems pathetically small in relation to aviation physiology as a whole. Yet out of appreciation of the honor which you have conferred upon me in inviting me to give a Mary Scott Newbold Lecture, and in deference to those who have stood here in the past, I feel that a few words should be said about something that may be regarded as an original contribution to better understanding of one phase of this subject, unimportant though it may be when viewed in its proper perspective.

We had found (4)—like others before us—that the stimulant effects of anoxia on respiration and circulation are due to reflexes from the carotid and aortic bodies, and that anoxia is essentially depressant, not stimulant, to the central nervous system as a whole, including the medullary centers. This is easy to demonstrate in a dog, in which acute anoxemia (produced by inhalation of a nitrogen-oxygen mixture, or by exposure to a low ambient pressure in a decompression chamber) causes hyperpnea, hypertension, and tachycardia when the animal is intact, while after denervation of the carotid and aortic bodies collapse and respiratory failure occur without any stimulant effects. We therefore thought it worth while to determine whether the convulsions which may occur during acute anoxemia are also due to reflexes. Unfortunately we were unable to elicit convulsions in animals by simple anoxemia, but were able to do so quite regularly by means of cyanide, which acts by inhibiting tissue oxidations. A normal dog given a suitable dose (about one milligram per kilogram) of sodium cyanide intravenously develops a violent hyperpnea, then passes through a typical epileptiform seizure followed by a period of prostration (11). During the convulsions and the ensuing prostration the animal is completely unconscious, and he recovers gradually in about ten minutes. If the animal's carotid and aortic bodies are denervated and the experiment is repeated a week or two later, the result is strikingly different. Hyperpnea and convulsions are lacking, there is no unconsciousness or prostration, and the only perceptible effect is a transitory weakening of the heart, doubtless due to the depressant action of cyanide upon it. It appears, then, that reflexes aroused in the carotid and aortic bodies by cyanide can cause a disturbance in the central nervous system strong enough to produce convulsions, and that the convulsions are responsible for the unconsciousness and prostration that accompany and follow them.

If this is the case it is possible that similar reflexes, aroused in the carotid and aortic bodies by anoxemia, may be a prominent factor in antagonizing the depressant actions of anoxia on the entire central nervous system. Sudden increase in the oxygen tension in the inspired air, as by the beginning or resumption of oxygen inhalation after a period of severe anoxemia, may then cause abrupt loss of consciounsess, fall of blood pressure, and depression or cessation of respiration, because it immediately removes the reflex drive and leaves unopposed the anoxic depression of the nerve cells of the cortex and of the vasomotor and respiratory centers. This offers a reasonable explanation for observations which have puzzled a number of students of aviation problems (8) (10); it may also furnish a partial explanation for occasional deaths after removal of a severe and long-standing tracheal or laryngeal obstruction (9). It also gives added emphasis to the necessity for avoiding severe anoxemia in aviation, as indeed in civilian practice as well.

At the present time research along the lines to which I have alluded in the course of this paper is being pursued actively in many laboratories, civilian and military. It is unfortunate that realization of the horrors of the employment of air power against civilians should have furnished the impetus for most of this work, at least among the United Nations. Yet just as those of us who have sons in the armed forces can derive comfort and satisfaction from the beneficial effects of their present experiences on their characters, so all of us can be assured that the present collaboration of physiologists, psychologists, physicists, engineers, flight surgeons, medical specialists and flyers, will have beneficial consequences of extreme importance to the future development of our civilization. Almost certainly we shall enter an era in which air transport will be used much more widely than it has been, which will mean that aviation medicine will become a respected and important item in the activities of physicians and of the institutions in which they are trained. The most important consequences, however, cannot now be foreseen, but will result from a better understanding of the way the human body reacts to stresses of various sorts, some of which have their direct counterpart in civilian

and industrial medicine. The advances made by medicine during the past century were not due to a sudden improvement in the sensory and mental acuity of the practitioners of medicine, but to a better understanding of the theoretical basis of their art—a basis which had remained substantially unchanged for more than two thousand years until the rise of modern pathology, chemistry and physiology, beginning less than a century ago, brought new perspectives and interpretations into medicine. Since then changes have come in a continuous succession, and the scale of living and the statistics for morbidity and mortality are evidence —if any is needed—that modern medicine is vastly more effective than it was a century ago. Yet one of the crying needs of medicine today is—as it always has been—for more effective correlation of theory and practice—for bedside interpretation and evaluation of the current viewpoints derived from studies on animals in laboratories, where it is possible to control variables and to multiply observations in ways that are unavailable to the practitioner. Aviation medicine is bound to foster correlations of this sort because it is essentially a clinical science and is interested primarily in the reactions of human beings, the behavior of lower animals, or parts of animals, being important only insofar as it elucidates the behavior of man. Methods of tremendous potential value for peacetime clinical research are now being used daily in decompression chambers, and others doubtless will follow. It will be surprising indeed if, when these methods and the results obtained with them become available for general use, they do not furnish a powerful impetus to clinical research of the most productive type and lead to advances that cannot now be foreseen. If the social sciences could be as certain as the physical and medical sciences of benefitting from the current wastage of human lives and property, we could look forward with assurance to a better, brighter world. At least the medical profession can continue to set an example of what may be accomplished when a sincere desire to ascertain the facts is the foremost consideration and any resulting action is conditioned always on the traditional: *Primum non nocere.* Perhaps it is not too much to hope that the social sciences and the political leaders throughout the world may, at some not too distant time, turn from their own traditional methods and strive to learn, from the experience of medicine in the past century, how to go about making real, lasting contributions to human welfare.

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A Saga of Fracture Therapy*

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THERE is every reason to believe that fractures have occurred ever since mankind has been in existence. Fossil remains have been removed from as far back as the Neolithic age which show results in fractures that indicate conclusively that some sort of treatment was practised satisfactorily. Sudhoff is responsible for the statement that the bones of Neolithic man show traces of attempts at corrections of deformities and he seems to think that enough specimens from that age have been found to justify what we might term to-day as follow-up statistics. Jaeger for example found that in such specimens good union was noted in 53.8% and bad union in 46.2%. These are certainly remarkable results when one remembers that these people had no knowledge of anatomy and only the crudest methods and materials to aid in reduction and fixation. So, fractures are not new in the field of surgery and there are written records of case histories that reach back several thousand years. In fact the Edwin Smith surgical papyrus, reviewed by Breasted and Smith of the Egyptian Government School of Medicine traces these records back to the Fifth Dynasty, or 4500 years ago. Their report, based on the study of some 5000 mummies indicates that fractures were common among the Egyptians, being found in about 4.5% of the bodies examined. In many of these the splints were still found in place, in which cases the lack of bone repair would seem to indicate that death followed shortly upon the injury. Due to the wide spread practice of fencing with sticks, fractures of the radius and ulna were frequent. These fractures, according to Smith, were treated logically and the results were excellent. The commonest splint material was the bark of a tree (acacia?) moulded around the forearm from the finger base to the elbow, the bony points being well padded with linen. In 100 cases studied, many compound, only one showed signs of suppuration, figures that equal or surpass our results of to-day even with the help of sulfonamides. In the femur fractures the results were not so good due to the fact that the hip was not fixed although the knee and ankle were, with the result as would be expected, namely, shortening, angulation and excessive callus—such treatment and results as may be found all too often in our records to-day (quoted from P. B. Magnuson). References in this same papyrus are made to fractures of the clavicle, humerus and vertebra. It states "if thou examinest a man having a break in his collar bone . . . thou shouldest place him prostrate on his back with something folded between his two shoulder blades; thou should spread out with his two shoulders in order to stretch apart his collar bone until that break falls into its place. Thou should make two splints of linen and apply both, one on the inside of his upper arm and the other on the outer side of his upper arm. Thou should bind it with linen and treat it afterwards with honey every day until he recovers." Treatment for the humerus is similarly described. Splints of a like nature are still employed in the Sudan and Abyssinia and in Borneo and elsewhere in the Malay archipelago, according to Mr. Cave of the Museum of the Royal College of Surgeons, London (quoted from W. A. Clark).

Hippocrates (460–377 B.C.) was responsible for the expression of all that was known of fractures and their treatment up to and including his experience. In his works on Medicine and Surgery, he contributed much epochal knowledge with his characteristic attention to minute detail in his description of management of reduction and fixation. He emphasized principles that are still practices and taught by our present day specialists in this subject. For instance, with reference to the humerus he states " . . . having got a piece of wood a cubit or somewhat less in length, like the handles of spades, suspend it by means of a chain fastened to its extremities at both ends; and having seated the man on some high object, the arm is to be brought over so that the armpit may rest on the piece of wood, and the man can

* J. Chalmers Da Costa Oration, The Philadelphia County Medical Society, May 19, 1943. Reprinted, by permission, with illustrations added, from *Philadelphia Medicine*, Vol. 38, Nos. 42 and 43, June 5 and 12, 1943.

scarcely touch the seat, being almost suspended . . .and with the arm bent at right angles, the best plan is to put around the arm a broad and soft skin or shawl and to hang some great weight to it so as to produce moderate extension; or otherwise, while the arm is in the position I have described, a strong man is to take hold of it at the elbow and pull it downward. . . . the physician standing erect must perform the manipulation adjusting the bone with the palms of his hands; and it will readily be adjusted for the extension (traction?) to exhibit a shortened thigh—the arm, however, when shortened might be concealed and the mistake would not be great, but a shortened thigh bone would exhibit the man maimed." Hippocrates further states that a physician who treats fractures must be equipped to do so under any circumstances, those in smaller communities must adapt whatever they have at hand to fit their needs. He describes the use of an ordinary ladder with pulley and rope (Fig. 4). He was the father of the fracture box (Fig. 5) so popular in Philadelphia until

Fig. 1. Two specimens of fracture of the forearm from Egyptian mummies. From the Nubian Collection, Royal College of Surgeons, London. No. 115 (above) shows the unwrapped arm with splints made from the midrib of the palm; No. 116 (below), the outer wrappings of the splinted arm. Both specimens belong to the Pyramid Age of the Old Kingdom, Fourth Dynasty, about 2500 B.C. (*Courtesy of William Arthur Clark, M.D., and the Journal of Bone and Joint Surgery.*)

is good if properly applied." In fractures of the thigh or leg he describes several mechanical means for exerting extension and counter extension. He used a fracture table or scamnum (Fig. 3), and stated that the best thing for any physician who practices in a large city is to have prepared a proper wooden machine, with all the mechanical powers, levers, screws, ratchets, etc.—either for making extension or acting as a lever; the perineal rest must be padded to prevent soft tissue damage. He apparently recognized the difficulties in femur cases and the possibilities of deformities—"for it is a disgrace and an injury to one's reputation recently, but now properly relegated to museums and store rooms. Figures 6 and 7 illustrate traction and counter traction. Attention was called to pressure dangers. Galen's (100–200 A.D.) glossocomium was employed for reduction (Fig. 8).

Hippocrates used throughout his writing the terms "extension and counter extension" which terms, of course, have been replaced by "traction and counter traction" by surgeons of to-day. This is the first authoritative account of permanent extension to be found. The first internal fixation is likewise mentioned in this treatise.

Compound fractures, particularly of the femur,

were considered extremely threatening to life and with the possibility of blame in view he advises the physician to "try to escape from such a case provided one can do so honorably, for the hopes of recovery are small and the dangers great

of to-day used by sailors for many years were used for the attachment of a windlass and pulleys (Fig. 8). Permanent or constant traction was accomplished in leg fractures by the use of thick padded cuffs or rings encircling the limb just above

FIG. 2. Anterior and posterior views of fracture of tibia and fibula from an ancient Indian skeleton found in a grave, five feet deep, under a heavy slab of limestone. The skeleton lay face down with arms and legs folded under the body. (From the Southwest Museum, California.) (*Courtesy of William Arthur Clark, M.D., and the Journal of Bone and Joint Surgery.*)

and if the physician do not reduce it he will be looked upon as unskillful, while by reducing it he will bring the patient nearer to death than to recovery." He advised treating fractures of the jaws by binding the teeth together with gold or linen thread. He described the appearance of the heel after a patient had fallen from a height and landed on the feet. He used skids similar to the ones employed to-day as levers in open reduction cases. He stated that this should be done before the third or fourth day—"for if the limb be disturbed on these days and yet the fractured bones not reduced, inflammation will be excited." Oribasius (325–403 A.D.) of the Byzantine School described an elaborate multiple pulley system which was used much by Paré. This fell into disuse then until revived in the form of the Russell traction of to-day.

Clove hitches identical with the Collin's hitch

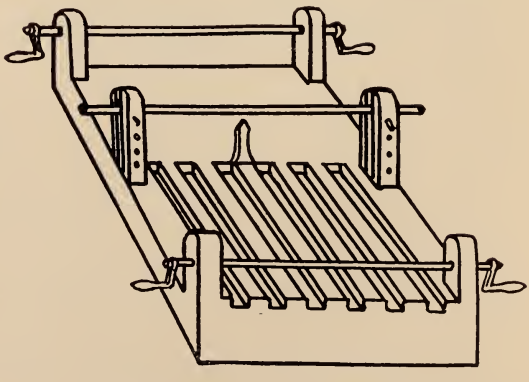

FIG. 3. The scamnum of Hippocrates. (After Littré.) (*Courtesy of Paul B. Magnuson, M.D., and the publishers of Surgery, Gynecology and Obstetrics.*)

the ankle, and just below the knee. Into sockets four elastic twigs from the cornel tree, cut a little

long, were bent to fit. Properly placed ties could change the tension and direction of the traction. An early forerunner of our modern unpadded plaster cast and moulded splints, as well as our gelatin boot, was the heated waxed bandage, reinforced by splints (Fig. 9).

Throughout his teaching appear numerous aphorisms of to-day, corresponding to our conception of early reduction, gentleness, thoroughness and individuality, as follows—"extension should not be delayed until the third day but should be carried out on the first day; the alignment must be regulated according to nature; slings can be used for upper extremities (could he be thinking of our hanging cast?); length and alignment are necessary in the lower extremity, obtained by traction and counter traction and splints; the knee be kept straight but the elbow should be bent; extension or traction should meet the muscle requirements; elevation will reduce swelling; the best way to reduce swelling is to reduce the fracture; a fracture properly reduced and properly dressed ceases to cause pain; fit the treatment to the patient; in compound fractures it is impossible to tell whether the bones will heal or fragments of flesh and bone be detached." In compound fractures he advised against the common practice of binding the limb on either side and leaving the wound out, because the wound then becomes discolored and gets into a throbbing and inflamed condition. Trueta and other wartime surgeons call attention to this fault to-day. A cerate mixed with pitch should be applied to the wound, covered with a thin compress. Splints should *not* be applied but the bandages should be sufficient to give some fixation and should be adjusted so that the pus can be discharged freely. A transverse fracture is easier to handle than an oblique one; fragments that are exposed and loose or stripped of flesh should be sawed off as they will die, become dry and exfoliate. He individualizes by condoning the lump in the healed fractured clavicle, as it does not cause disability, here advocating that function should be striven for at the expense of deformity.

Fig. 4. Reduction of both bones of the forearm at elbow. (*Courtesy of Paul B. Magnuson, M.D., and the publishers of Surgery, Gynecology and Obstetrics.*)

Fig. 5. Box splint or "canal". (After Scultetus.) (*Courtesy of Paul B. Magnuson, M.D., and the publishers of Surgery, Gynecology and Obstetrics.*)

The healing time for a fractured humerus was stated as 40 days, and if not solid at that time a stricter diet (not stated) should be given. He warned against meddlesome treatment and too frequent examinations. He believed that union occurred earlier in some individuals than in others for "one constitution differs from another and one period of life from another."

These teachings of Hippocrates were carried to Rome and yet for many years only Greek surgeons were considered worth while and notable. In the first century A.D., Martial stated that Hermes was recognized as the best surgeon for fractures and at that time called attention to the great number of specialists, such as stone cutters,

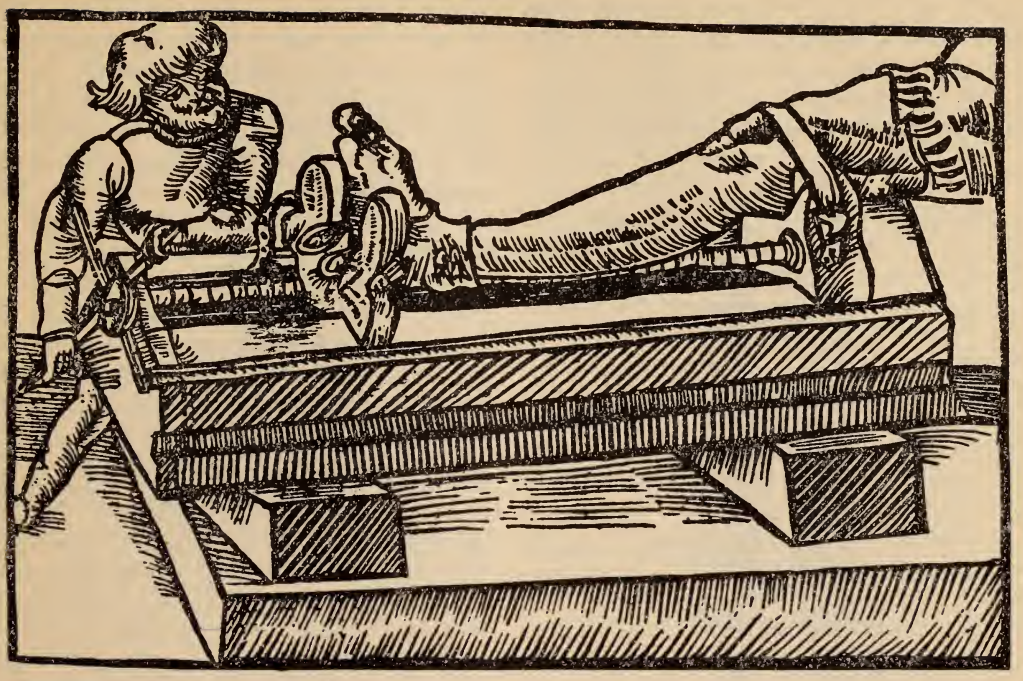

FIG. 6. An instrument to make a crooked knee straight. (*Courtesy of William Arthur Clark, M.D., and the Journal of Bone and Joint Surgery.*)

FIG. 7. Illustrating traction and countertraction together with the use of coaptation splints. From Bruynswyke, 1525. (The Huntington Library.) (*Courtesy of William Arthur Clark, M.D., and the Journal of Bone and Joint Surgery.*)

bleeders, bone setters and brand removers (from slaves) as well as removers of enlarged tonsils. About this period, 130–200 A.D., Galen, the Hippocrates of Italy, surgeon to the gladiators, wrote upon fractures and contributed the results of his

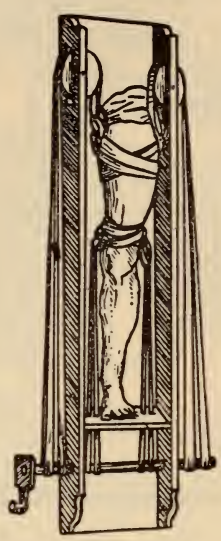

FIG. 8. The glossocomium of Galen, for reduction use. (After Vidius.) (*Courtesy of Paul B. Magnuson, M.D., and the publishers of Surgery, Gynecology and Obstetrics.*)

large experience. At this time also there is evidence that dissection had been carried on upon apes and presumably upon the bodies of criminals.

For the next four or five hundred years there was practically nothing recorded about fractures or their treatment, due to the wholesale destruction of medical literature during the early centuries of the Christian era. A few of the works were rescued by the Church who guarded this knowledge for their own control of medical matters. A more serious destruction of medical works occurred about 638 A.D. when the famous libraries in Alexandria were destroyed by the Arabian invader Amran. After this the Arabian school took up the subject and produced much of interest and importance, as shown by the contributions of Rhazes, Avicenna, Albucasis, Avenzoar and others. Two of these gentlemen, Avicenna and Albucasis, advocated closing the wound in compound fractures. The former practiced open reduction and advised for the correction of non-union that the flesh be cut and the callus removed by rubbing it away, then the bone could be restored to its good position. He further stated that the causes of non-union were "multiple embrocations with warm water, frequent changes and haste and moving the organ; when there is little viscous blood or too great stricture which prevents the limb from being nourished; or the presence of pieces of bone." This expression differs but little from our modern enumeration of causes, namely, faulty fixation, faulty approximation and meddlesome surgery and faulty blood supply. Another

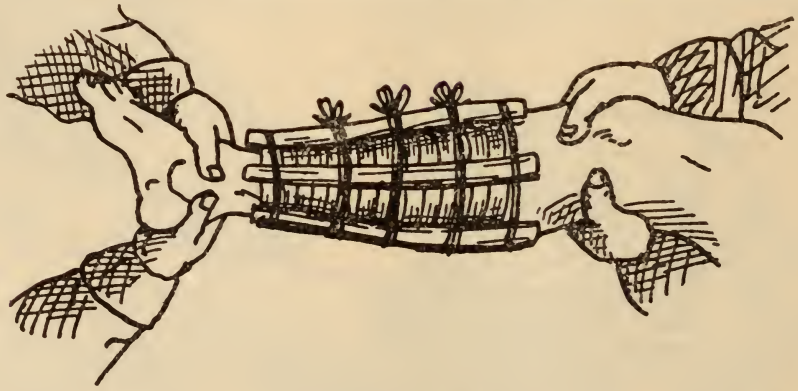

FIG. 9. Applying the splints on the seventh day. First the two bandages have been put on, then the waxed pads, the bandaging to fix which can be seen under the splints. (After Scultetus.) (*Courtesy of Paul B. Magnuson, M.D., and the publishers of Surgery, Gynecology and Obstetrics.*)

Arabian physician in the 10th century emphasized the importance of crepitus in the diagnosis of fractures. Albucasis called attention to trauma as the cause of fractures of the spine and stated that this could cause deformity the same as attrition did, possibly referred to tuberculosis. He considered that a broken back with loss of control

of bladder and bowel was doomed and it was useless to try and cure it.

Again the theatre of activity in fracture circles changed and France occupied the stage. The French surgeon, Guy de Chauliac (1300–1370) became prominent and his ideas were voiced by subsequent writers for several centuries following his death. This gentleman although avowedly a surgeon managed to win as great a reputation and as high a social position as was possessed by any physician of that period. The medical practitioner, it will be remembered, held himself to be a much higher type of man than the surgeon. He used many medicaments, salves and ointments, giving a list of dozens of mixtures to be applied to the limb. He advocated a type of debridement for compound fracture, removing all foreign bodies and loose bone, followed by deep and firm closure of the wound. As is true to-day, especially in our war wounds, there were many reputable surgeons then who did not advise closure. In addition to the use of coaptation splints of all sorts of material from leather to iron, he advocated the application of the widely popularized "egg white." He was one of, if not the first surgeon to suspend the limb in a cradle and introduced the first real fracture bed perforated to permit the patient to have a stool and with a cord and trapeze hanging over the bed so that the patient could use it to change his position in bed. He voiced the opinion that splints were only to "sustain" during the first seven days until the swelling subsided after which they were to be placed so as to actually restrain the bones. This practice closely approximates the idea of delayed reduction, even unto the same number of days, employed by some of our surgeons in this country to-day with, I am free to confess, apparently excellent results. deChauliac mentions central fracture dislocations of the hip diagnosed without help of the x-ray, and stated that the head of the femur was often pushed into the abdomen and the condition was very difficult to remedy. In short he made use of weight traction, suspension, a form of Balkan frame, open debridement and wound suture.

France, also, in the 15th century required that the barber surgeons must be examined in the care of fractures and dislocations before the mayor. Vesalius (1543) when only 29 years of age put anatomy on a firm footing in relation to the cause of deformity and the principle of "muscle equilibrium" as understood by us to-day. Ambroise Paré (1510–1590) contributed information about fractures of the patella, dressed in the straight extended position; union required 40 days or more and a limp always followed especially on ascending stairs. During this period so-called bone setters took care of many of the fractures and dislocations both in France and later in England and Wales, one family for eight generations produced bone setters and the Thomas family, of Thomas Splint fame entered the picture (1735) and developed 21 practitioners, representing both sexes. In America the Sweet family of Rhode Island was famed as such setters one of them having cured DeWitt Clinton of Erie Canal fame, after 52 physicians had failed.

The scene again changes, and the English speaking peoples now interested themselves in the study, practice and teaching of fracture principles. In England there appeared in 1525 the first book on surgery—a translation of the work of a German named Brunschwig. In addition to quoting deChauliac, Avicenna, and other authorities, he added some rare and wondrous medicaments of his own, namely oil of roses, myrtle berries, various powders, and the inevitable white of egg. The records show that at about this time experimental surgery was undertaken on dogs to prove the efficacy of a powder made of "bolarmen, ambra or walderote, small barley meal" and white of egg, again. Directions were given for the reducing of a fractured jaw by pressure within and without the mouth. Here copper wire appears as a fixation material. He recognized back injuries and localized the lesion in a general way by observing the limb that was paralyzed. If no paralysis, the bones were set and one of his famous plasters was applied, adding dragon's blood in some cases. He mentions green stick fractures, a method of reducing forearm fractures, a dressing for finger fractures and repeatedly warns against causing pain by your handling and splinting.

Another translation from DiVigo (1520) adds earth worms (could this by chance hook up with the more recent maggot?) (guess not). Here was an early advocate of emergency treatment. This same treatise advocated traction, windlasses, coaptation splints, etc. He quotes the time required for union, namely, the shoulder, 24 days; the humerus, 40 days; the arm (forearm?) 24 days; the thigh, 50 days and the leg, 40 days—all being reasonably close to our estimations.

Thomas Gale (1507–1586) who served with

Henry the Eighth in France, classified fractures as simple and compound, including with the open wounds those which had "one or more effectes to it connected or ioyned" such as gangrene, inflammation, severe contusion, too much callus, or too dry or too moist a callus (rather our interpretation of complicated fracture).

Ambroise Paré (1510–1590) mentions the danger of distraction of the fragments by too much traction with the glossocomium or with the pulley—an ever present danger recognized to-day in all sorts of traction treatments.

William Clowes (1540–1604) rated as the best of early surgeons of England added one ointment of 44 ingredients to the already shot and machine gun therapeutics for broken bones. He mentioned white of egg mistifying with the addition of vinegar. After the use of the glossocomium in reporting a case, on account of complications, a consultant was called; nevertheless, afterwards the patients and friends "used words", the chief matter being a shortening of the leg. Clowes told them that much might be done in young persons which in the aged oft times did not happily fall out (a nice example of individuality of treatment with regard to age).

Peter Lowe (or Love) (1550–1612) added to our knowledge the significance of deformity and "noyse or bruit" on handling. He added card board and white iron to splint material and called attention to the use of a third posterior splint (our gravity splint) in addition to the two lateral ones in leg bone fractures. He also described an adhesive paste made of egg white, masticke, etc. by which cloth could be made to stick to the skin making it useful in closing wound in place of stitches. He warned against the injudicious refracture of a vicious union—"better suffer a little deformity of the part than loss of the whole body."

Stephen Bradwell in 1633 in a book on emergency surgery did not discuss fractures, the inference being that he disdained to be associated with the bone setters whose art was "learned by writing and not by sight."

John Banester (1550–1610) added but little to the store of knowledge on fractures beyond some generalities about malunion and the softening of the callus with applications and breaking and correcting the deformity. Up to this time there had not appeared in London any mention of extension or traction with weights and pulleys. Physiotherapy was used in the form of a sweat house and the need for emergency treatment stressed.

John Aitkin, University of Edinburgh, 1779–1790, urged the immediate immobilization at the site of the accident, now expressed as "splint 'em where they lie." He quotes LaFaye as advocating such transportation fixation for the wounded in battle. Baron Larrey, Napoleonic surgeon, the founder of the "flying ambulance" also emphasized this.

Sir Astley Cooper, 1768, who established permanent extension in England, described a well leg traction apparatus that is a ringer in principle for the present day popular Roger Anderson gadget.

The American Indian—Winnebago and Dakota tribes and others, used coaptation splints of cedar and wet birch bark moulded to the injured part and allowed to dry, being tied for stability. This same people cut and moulded and bound wet raw hides to the limb. This was allowed to dry forming a perfect fit to the contour of the limb. Gypsum, the forerunner of our moulded unpadded plaster of to-day, and used by Hendricks in 1814, simulated this. Mathieson of Holland first used plaster of Paris. Although traction is not mentioned, very few crippled and deformed Indians were to be seen. W. J. Hoffman writing in 1879 states that in his association with thousands of Indians he never saw a crippled or deformed one. It was early established that our Indian brothers in general knew more applied anatomy than our laity. They did, however, fashion their splints sufficiently long to fix the joints adjacent to the fracture, which the European surgeons had not done up to this period. According to Andros (1883) they treated a compound fracture of the leg as follows: A cylindrical piece of bark, larger than the limb, was applied to the back of the leg and thigh. It was cut deeply at both sides of the knee, so that it could be bent to an inclined plane. The splint was then filled with soft clay and the limb imbedded in it from heel to groin with the exception of an opening left for the care of the wound. Here again we may find fracture boxes of the double inclined plane type still existant in some of our older hospitals in this country. Although the old wooden box is outmoded, nevertheless the Hodgen splint, the Thomas and Pearson attachment and the Boehler frame still are fashioned on this old principle.

Sir Astley Cooper with his text book awoke much interest in fractures and with N. R. Smith's anterior metal splint with overhead suspension with weights, duplicated by Daniels of Georgia, further problems were solved. Van Ingen in 1857 supplemented this method by raising the foot of the bed and so using the body weight as counter traction. Almost simultaneously J. K. Rodgers first used wire as internal fixation for ununited fractures. Barton, of Philadelphia, in 1834 advocated and practiced wiring of the broken patella. Hunt of this same city devised the sand bags, thus going the Indians one better (Andros), likewise the French (deChauliac) with his bags of straw.

Hugh Owen Thomas next appears on the scene with his famed traction and suspension splint so widely used for transportation of fractures in both upper and lower limbs. Many of the nations at war to-day use this splint which was found so efficacious in World War No. 1, nearly sixty years later. It is still widely used in First Aid instruction the country over.

In 1895 Roentgen astonished the world with the x-ray. With this aid the surgeon was enabled to view his results and some sensible men soon learned that perfect cabinet reposition of fragments was not necessary for ultimate good function of the part. Fluoroscopic reduction followed rapidly and further influenced us to try for perfection on the film regardless of the amount of repeated trauma to the part with its numerous sequelae. It hurts not to remember that the aims in fracture treatment are life, limb, function and restoration of contour, in that order.

In 1910 the British Medical Association reviewed their reported results of simple fractures in a period from January, 1906 to December, 1910. They found that good results were obtained in 45.4% of the cases without anatomical reposition and in 66.3% of cases, good functional results were obtained by anatomical reposition. Their conclusions were that no method—operative or non-operative—which does not definitely promise a good anatomical result should be accepted as the choice.

Up to this period open reduction and internal fixation ran second to closed reduction in the fracture field but about now (1910) Sir Arbuthnot Lane popularized operative treatment and the use of buried steel plates. As a result the men treating fractures with relatively few exceptions ran wild with the scalpel, plates, screws, wires, bolts and intricate contraptions. This produced beautiful temporary cabinet makers jobs, which, however, all too often did not stand up but rather were followed by infection, loosening of screws, a broken plate, osteomyelitis, non union, sinuses, multiple operations, stiff joints, loss of limb, etc. Despite this picture the operative treatment has its place, in its place, namely, the hands of the experienced, clean, gentle mechanically minded artist, many of whom still live and practice the treatment that gives the best results in the most cases. (The indications for open reduction—failure to obtain and maintain satisfactory reduction by proper closed treatment and the surgeon's expectation that he can by operation give the patient a better functional result.)

At this period the practice of open reduction and the application of steel screw bolts, two on each side of the fracture and long enough to reach beyond the skin surface to be fastened together externally by an adjustable bar (Parkhill clamp) was employed. The surgeon could thus remove this later without reopening the operative site.

It seems strange that skeletal traction should not have been employed more generally until 1909 when tongs or calipers replaced the pin to some extent about the time of World War No. 1.

About 1910 Finochietti devised his stirrup—a steel adjustable band that could be threaded over the os calcis for traction attachment. Steinmann produced his famous nail with which to transfix bone, thro minute skin puncture wounds. A later refinement was a threaded joint in the center of the nail or pin to permit separation and extraction, from both sides of the limb.

Kirschner followed closely with the taut piano wire with a bracket for traction attachment. Screw eyes were added to complete the period of skeleton or direct bone traction in shaft fractures in particular.

Dr. Charles Scudder, of Boston, in 1917, established in the Massachusetts General Hospital, what seems to be the first dyed-in-the-wool fracture service, in this country at least. This plan is in vogue to-day in most modern hospitals. Close on the heels of this radical move he and twenty-five surgeons in the United States and Canada met in Boston and really formed the still existing Fracture Committee of the American College of Surgeons. From this beginning Dr.

Scudder gradually organized Regional Fracture Committees as daughter groups over the country, of which there are now many. All of these meet at least annually and discuss fracture problems.

Wm. Sherman improved upon the Lane plate and screws, with vanadium steel, self tapping screws and bolts. Magnuson, 1909, now added beef bone and ivory screws and inlays. Albee perfected autogenous bone inlays, medullary pegs previous to this. In 1878, Thomas, of Liverpool, and Dombrowski, suggested the use of the Thomas knee splint and later employed it in 1882. Krause, Korsch and Dollinger all made use of some form of ambulatory splint. Warbasse of Brooklyn reported six successful cases in 1893. Edward Martin, of this City, reported 20 cases so treated.

The most radical change in recent years that demands attention is the rapidly spreading use

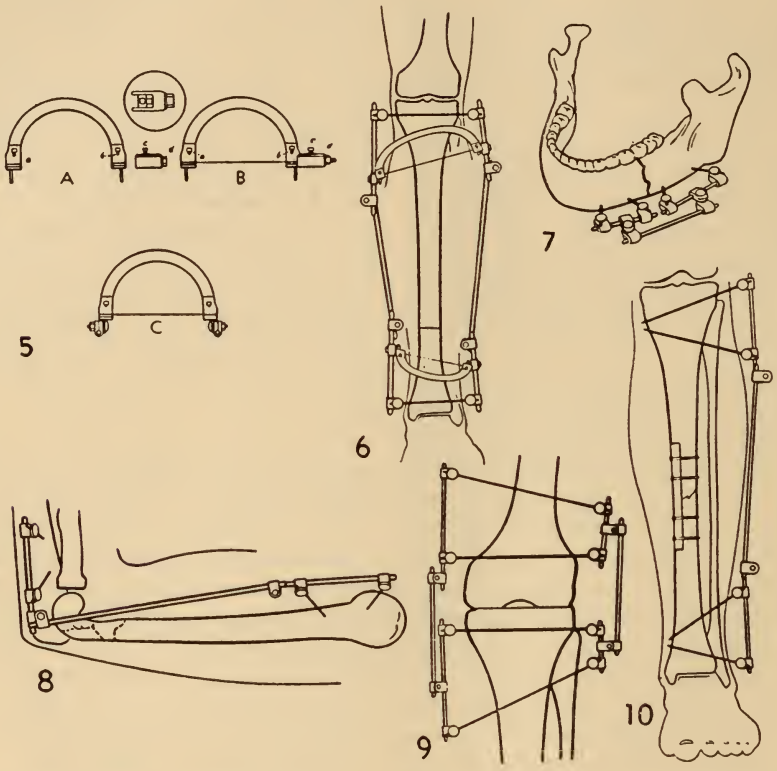

FIG. 10. The Roger Anderson Splint. (*Courtesy of the Editor of the Journal of the International College of Surgeons.*)

and other ingenious shaped forms. More recently Venable added vitellium as the improved metal for the buried hardware and still later Wm. Darrach and C. R. Murray have perfected a special steel composition as the latest thing.

From Europe appeared Boehler's work with the associated use of many ingenious mechanical aids, not to forget his skin tight or unpadded cast with walking irons that permitted ambulatory treatment. The ambulatory treatment for fractures of the lower limb was practiced many years of the "hanging cast" for humerus fractures, omitting all fixation at the shoulder joint. Despite this violation of the fixation principle excellent results are almost universally obtained (Griswold, North).

Very recently many enthusiastic surgeons are injecting the simpler fractures without displacements with novocain and permitting immediate use of the part. The linear fracture through the lower end of the fibula lends itself admirably to this radical treatment (Ferguson, Erb).

The principle of pin, or external bar, and brace fixation of Parkhill mentioned above, has been vastly improved, and has become more and more popular, so that to-day the Roger Anderson, the Haynes, the McKibbin and the Stader splints with their use of multiple pins are delivering large the teachings of Hippocrates and other ancients are still sound as to the principles involved, that most of their methods of reduction and the mechanical principles of the same are still practiced by us. The old timers did not have the wonderful, ingenious, intricate, complicated

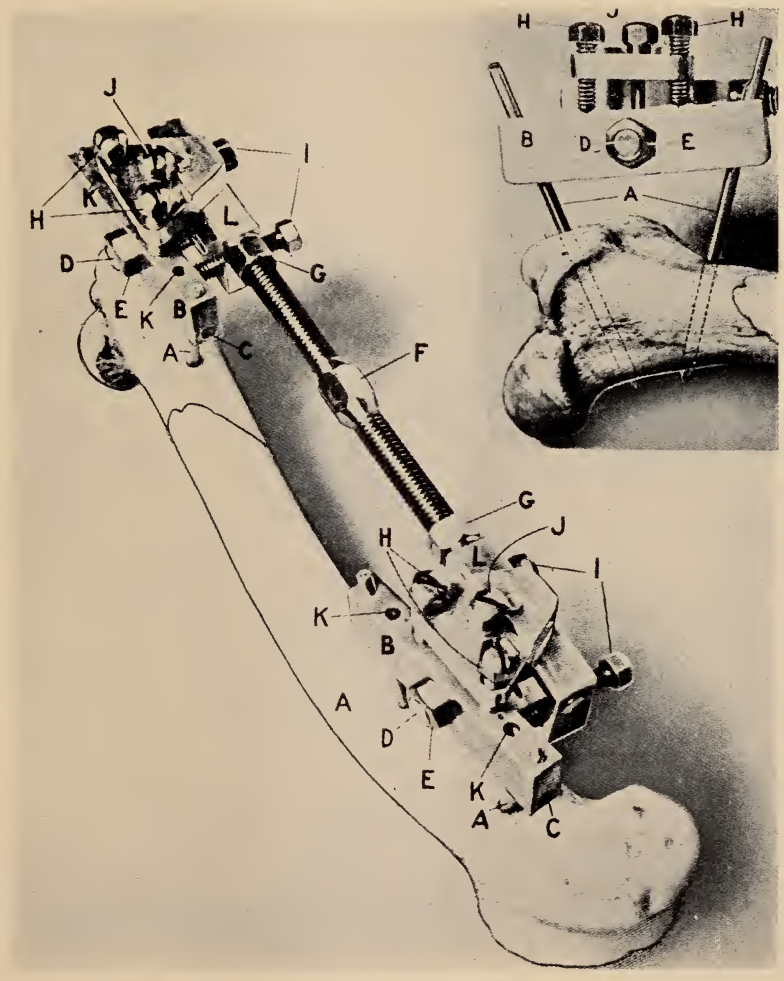

FIG. 11. The Stader Splint. (*Courtesy of J. B. Lippincott Company, publishers of the Annals of Surgery.*)

excellent service and bid fair to supplant the pulley and weight with the internal plate and screw fixation appliances in military surgery where transportation may be necessary at any time. Patients with the Stader type of splint may use the part—even fractures of the tibia and fibula—with some degree of freedom.

In retrospect we can safely say that by and apparatus together with screws, bolts, malleable wire, and motor saws and drills that are at hand to-day. It is only fair to say that in the hands of the particular devisor, each appliance will give great results, but there must be the true mechanic behind the gadget, who will fit the treatment to the patient and not the patient to the treatment. Principles are general and abstract.

Practice must, of necessity, be concrete and individual if we are to deliver a functioning limb to our living patients.

I wish to state that a great deal of the historical data and reproductions of old illustrations were taken from the admirable articles on the subject published by Dr. Paul Magnuson of Chicago, in 1936, Dr. Wm. A. Clark, of Pasadena, California, in 1937, Dr. Lester Blum in 1935 and Dr. A. H. Breck, in 1917, and Dr. I. Cohn, in 1939. I further have quoted often from their individual texts when it seemed the best means of expression.

Ophthalmology in Philadelphia in the Early Eighteen Nineties*

By BURTON CHANCE

THE Section on Ophthalmology of the College of Physicians of Philadelphia, through the members, has served the community, the City, the State, the Nation, and the World. No one attending the Section in the past twenty-five years would believe that the College debated for three years or more before consenting to the creation of a "Section"; yet, the American Ophthalmological Society had been in existence since 1864, and, a 'Section' of the American Medical Association had been active since 1878!

One may consider several reasons for the unwillingness of the Fellows to consent to the establishment of such a dividing of the interests of the College. There was, throughout the profession in Philadelphia, a reluctance to allow specializing in Medicine. Most practitioners prided themselves on their ability to attend to any case brought to their doors. Of the fifteen Fellows who, in November, 1892, signed the petition for the formation of this "Section," eight were in the general practice of either Medicine or Surgery, and, they undertook ophthalmic cases as matters of course. D. Hayes Agnew was Professor of Surgery at the University; Gwillym Davis, surgeon at two or more hospitals and systematically undertaking orthopoedic patients; Hunt, Surgeon at the Pennsylvania, and so was T. G. Morton. George Piersol was devoting himself to Anatomy; John B. Roberts was seeking to advance his skill in plastic surgery; Augustus Wilson operating on joints and tendons, emerging into modern orthopoedics, and so, also, was J. K. Young. Notwithstanding, all these well-known Fellows treated eye cases. Last year there was presented at the Ophthalmological Society the trial-lens frame used by Professor Gross! I have the remains of G. G. Davis' case of eye instruments; some ophthalmological works from Morton's Library, and Augustus Wilson's copy of Soelberg Wells' "Treatise on the Diseases of the Eye."

It was feared that the would-be 'Specialist' Fellows might form a separate organization; so, when, at last, permission was granted, it was with the expressed proviso that a new 'society' should not be constituted. And—the lower committee-room at the 13th and Locust Streets' end of the first floor of the old building was assigned to them. There, in that dingy room, lined with stuffed book cases, with locked doors, several wooden benches were provided. Sessions were held on the third Thursday of the month from November to May. Of course, I was not in at the beginning; the first meeting I attended was on the 16th of December, 1895; Dr. Norris was the Chairman. In time I became acquainted with all the original members certain of whom were later my dear and revered friends, and from them I learned of the early days of the Section.

It should interest us to recall what brought the Fellows together. It was felt that Ophthalmic subjects ought to be given deeper and closer attention than was possible by those who, in the course of one twenty-four hours might, in the morning, "have set a fractured knee-joint; reduced a femoral hernia at noon; excised a breast after lunch; fitted an old man with reading glasses and operated for Cataract later in the day." (Dr. Davis once reported to me that he had had such a day's work.) Or, when at a meeting of the College, one, occupied with ophthalmic subjects, attempted to gain attention from the assembled Fellows on the "Absolute Static Refraction of the Eye." (The title of a paper by Dr. Jackson.)

At last the Section got under way and the meetings began to be attended by Fellows and, invited, members of the profession. Definite programs were arranged and rare and useful cases presented—both for exhibition and to show the results of treatment. And papers were read setting forth in scholarly manner the results of the essayists' own contributions or the summary of others' research. In all the fifty years there has

* Read at the 50th anniversary celebration of the Section on Ophthalmology of the College of Physicians of Philadelphia, April 3, 1943.

never been a meeting passed nor a wholly uninteresting program offered.

Most of the early members, at one time or other, had been associated at Wills Hospital, as Surgeons or clinical assistants. Their desire for the establishment of the Section can be well understood, and it was by their devotion to the science and practice of the 'specialty' that "the Philadelphia School of Ophthalmology" brought fame to the City.

A glance at the programs of the years 1890 to 1893 would show us the topics with which they were engaged. I have had deep admiration of the efforts of those men. What industry! How crude, we might declare, were their "instruments of precision"!

Antisepsis of the eye was uncertain and confused. The Bichloride, and other compounds, of Mercury were employed in varying degrees of strength—some, alas, in escharotic proportions. In serious and prolonged operations general anesthesia was employed. Chloroform was still in use. Was it not in 1884 that Koller had found Cocaine capable of ensuring complete local anesthesia? Bacteriology was cautiously advancing the truths of its findings.

Much, in those early days, was attended to in the patients' homes.

While all hospitals maintained "Eye Dispensaries," the patients were regarded as "Out-Patients." When indoor-treatment was required, to admit the patient permission to place the patient in his ward had to be obtained from the general medical or surgical member on duty. Dr. Norris informed me that for some years he maintained, at his own expense, an 'Eye Ward' at the University Hospital. Elsewhere the patients occupied beds in the wards—and the Eye Man was regarded almost with sufferance. At the Hospital where I was resident the Attending Surgeon who, one day arrived some time after the Ophthalmologist, objected strongly as I had begun to make 'rounds' of the eye patients then in his general ward.

Ophthalmoscopes were being invented, modified, and improved by the score; the difficulties of satisfactory use of them so great; and the literature relating to ophthalmoscopes was so voluminous that many a would-be-ophthalmologist gave up in despair of ever becoming expert in their use.

General practitioners in those days knew some things—Cataract, and Glaucoma, and Iritis, as well as "bloodshot eyes" and "conjunctivitis"—and deemed themselves capable of caring for all such patients. Perhaps some would send defective-sighted patients to "Queens," or to "McAlister's," for a pair of spectacles. Astigmatism was regarded as an ultra refinement of the 'Eye-Man' who, it was sometimes said, was only assuming it to be an actual defect. Risley and Randall had only recently published the reports of their laborious and painstaking examination of the eyes of the children in the Public Schools.

Something was known about Choked Disc and Albuminuric Retinitis, such cases, it was likely, came under notice only late in the course of the disease. Too many were skeptical of the opinion that the condition might be diagnosed and the affected one's life preserved by early and repeated exploration with the ophthalmoscope. Intraocular signs of cardiovascular disease were still questionable in their minds; however, the abnormal findings in the choroid and retina associated with such disorders were studied with increased attention. The helpfulness of the ophthalmologist, shown towards his colleagues in charge of the case, stands as one of the benefits of specialism in Medicine. Dr. Norris told me that for several years after his return from his course in Europe he visited the medical wards at the Pennsylvania Hospital every Sunday to study the eyegrounds of the patients bedfast there. Imagine the difficulties—a candle, or a smoking portable lamp, and a reflecting ophthalmoscope.

Ophthalmia, a generic term, was employed in speaking of Conjunctivitis, which existed in many clinical forms, acute and chronic in all degrees of severity and consequences. Except for the gonococcus, no special organism had yet been isolated to explain the causes of the several varieties. Diphtheria not infrequently invaded and destroyed the eyes.

Blennorrhea in adults and the newborn, the gonorrheal conjunctivitis of later days, was not by all regarded as dependent on the diplococcus of Neisser. It was likely to be called 'purulent ophthalmia'; the dire consequences of the disease were looked upon frequently as inevitable. Patients were as likely to be found in the practice among the well-to-do and others, as in the service of midwives in the poorer sections. The list of remedies was legion, despite Credé's teachings and direction. The young victims crowded the Schools for the Blind.

There were no immigration restrictions—thousands of trachomatous persons went through the City, regardless of their contagiousness.

The only criterion accepted in presumed syphilitic disease was the "therapeutic test"—namely, after specific medication, the regression and ceasing of observable symptoms. It took many years for Hutchinson's dictum of 1866 to be accepted that recurring 'Interstitial Keratitis' was an expression of inherited syphilis. When the deformed permanent teeth appeared the doubtfulness was likely to be less, and, when the child's hearing became dull—the observer might strip the child and detect osseous signs of the malady.

It was recorded at the period we are recalling that disease of the choroid and retina was, alas, too frequently the result of syphilitic infection, congenital or acquired. Again, we to-day must remember there were no means but the clinical manifestations by which to obtain a diagnosis of lues.

Affections of the tear passages resisted, from the time of Percivall Pott, probing, slitting and syringing, until the radical extirpation of the sac was perfected. Does anyone nowadays see a ruptured lacrimal abscess with its noisome fistula?

Infectious effusions from the sac, not previously pronouncedly apparent, frequently caused loss of the eye after Cataract and other incision operations. Few then imagined how damaging affections of the sinuses adjacent to and connected with the orbit might become.

Erosions of the cornea; abscesses, as well as inflammations of deeper layers obstinately refused to heal. At that period it was observed that incidence as well as healing depended on insufficient diet, and that by reorganization of the dietary to provide nutritive elements—such elements as are now known as "Vitamins," favored recovery and permanent healing.

All the acute infectious fevers—Measles, Scarlet Fever, Diphtheria, Small Pox, Cerebrospinal Meningitis, especially during epidemics, presented more or less ocular symptoms. In prolonged convalescence from these diseases which in the 90's were more common than since, serious conditions not infrequently followed, as in the case of tuberculosis after measles. How frequently in those 1890 years were children, the victims of Scrofulous Ophthalmia, brought to the clinics with phlyctenular diseases of the conjunctiva and cornea—an affection almost not seen to-day! In the report of the Wills Hospital for 1894, 243 cases affecting the Conjunctiva and 207 of the Cornea were recorded.

The diagnosis of Glaucoma engaged many an earnest observer. The mysteries of its causation perplexed them, exhausting their ingenuity. More and more was the general system studied to enquire whether or not the eye might express the state of the general health. Commonly, premonitory stages were seldom accurately observed. If surgical measures were not immediately indicated, miotics being used, certain observers were so highly impressed by the effectiveness of these alkaloids that, when an attack was believed to be impending, the persistent employment of pilocarpine or eserine was noted to have defended the eye from an outburst. Such ideas as these agitated the minds of all—Reliance rested on Iridectomy chiefly; yet paracentesis of the cornea and sclerotomy were constantly practiced by certain operators. It was noticed, however, not all eyes were helped, indeed, some were made worse, by iridectomy and other operations. Confusion existed in cases not glaucomatous as to the origin of excavation of the nerve head so exactly resembling the cupping in Glaucoma—distinguishing essential atrophy of the optic nerve from simple chronic Glaucoma.

Osler and other enquiring minds, of influence in those days, insisting on the examination of the ocular fundus, brought to attention the changed pictures dependent upon blood dyscrasias as in anemia, polycythemia, leucocythemia, as well as those of pronounced, and then well-known, signs of Albuminuric Retinitis. Frequently what seemed to be a normal fundus with no signs of exudations or atrophy, exhibited marked alterations in the vascular systems; the vessels might have lost the wavy outline, being more or less straight in their course and so stiff as to press more or less deeply indenting the underlying accompanying vessel; perhaps with interruption of the blood columns.

Perhaps no ophthalmoscopic study yielded in the ensuing years such results as this field, so ably begun and here pursued by Dr. de Schweinitz, for, we learned that those more or less minute alterations presaged the gross manifestations of disease noted in the early days of the use of the mirror.

Diabetic cases were encountered frequently during this period, commonly so far advanced as to have cataract, and the general conditions contraindicating extraction. Also, states of general

health accompanied by low grades of uveitis, considered to be the result of what was deemed an "auto-intoxication," the term being rather broadly used, yet it was thought that the state of health depended on the faulty action of the intestinal glands. Some observers, however, began to examine into the state of the teeth and the tonsils, disease of which they believed could affect the whole system; and, when such faucial maladies were made healthy, the general health improved and the ocular symptoms lessened, if they did not disappear completely. It is impossible for us to praise sufficiently those who insisted on the removal of the dental and faucial pathological entities. In this connection, many patients were classed as gouty or rheumatic.

Cataract absorbed the minds and attention of all. Any discussion at the Section was quite likely to be animated, sometimes acrimonious. "Should one operate *early* before the cataract had become ripe?" "Should one attempt measures to hasten ripeness?" "Should the operation be 'simple,' or should one always perform Iridectomy in combination, or preliminary?" "Dare one remove the entire lens without lacerating the capsule?" "Leave particles of the cortex, or, flush them with sterile water from a syringe?" And, "how should the eye be dressed? Simply light pieces of gauze and cotton; or isinglass? Or, with a wide flannel figure-of-8 roller bandage?" During the adjustment of the "Figure-of-8" eyes sometimes were destroyed.

That dreadful malady, Sympathetic Ophthalmia, was frequently reported. Much speculation existed as to the origin of it—"were infectious products carried to the sympathizing eye by the blood stream"; or, "was it the result of reflex action through the ciliary nerves"; or, "were microorganisms circulating within the sheaths of the optic nerves?" Some observers classed it as a 'migratory ophthalmitis'. It was indeed a speculative subject.

The proposal for a Section received great support from Weir Mitchell whose influence, in all that pertained to the advance of Medicine, was progressing in power and extent. He continued his membership for years, and, through his collaboration, subjects relating to Neurology soon began to be offered for discussions at the meetings. The operation of the Infirmary of Nervous Diseases—the old Orthopedic at 17th & Summer Streets, began to attract several among those whose conception of the function of the Ophthalmologist included the observance of signs of abnormality in the ocular nervous responses associated with the disorders manifested in the cerebrospinal system, in addition to the well-defined signs of oculomotor pareses. The debt owing to Ophthalmology by Neurology is still recognized. Was it not Hughlings Jackson who declared that he owed his success in the study and comprehension of Neurological considerations to his having been an Ophthalmologist in his early years?

And this aspect of Ophthalmology was directly associated with the signs of weakness of the ocular muscles in the classification of the functional disorders of the extraocular muscles, in large measure dependent upon faulty structure or inequalities in length or strength, producing derangement of "the external muscle balance." All the signs were comprehended under the term Heterophoria with the divisions Exophoria, Esophoria, etc., introduced by Stevens, terms distinctive and exact in their designation of the conditions.

The subject of the Movements of the Eyeballs and their Anomalies was assuming an importance far greater than ever before. No longer was it only internal 'squinting' that received attention; each muscle was found to give its own symptoms and to combine with the symptoms elicited from all the others. Not only was simple complete tenotomy, chiefly of the internal rectus muscle, performed, but each of the others partially or completely, and, the opposing muscle advanced to a degree to assure parallelism in position and unity of function, and, if needed, combining the two operations. In all cases efforts were made to reduce the accompanying amblyopia so commonly found in such squinting eyes; not only was the cosmetic effect sought but the visual strength ascertained and developed.

So intimately were muscular insufficiencies or heterophoriae connected with evidences of Ametropia that no case of Hyperopia or Myopia could be properly studied without due attention to the symptoms apparent, or elicited from the state of the muscles moving the globe.

Refraction was regarded in some quarters rather lightly. The farsighted were given plus spheres and the nearsighted minus. Astigmatism of one diopter or more was attended to, but partial amounts might not be corrected unless distinct symptoms demanded glasses. It was not long after 1890 that it became known that the most

painful cases of eye-strain were relieved by cylinders of less than one diopter, in $\frac{1}{20}''$ or $\frac{1}{48}''$. Trial lens cases contained few of fractional measures above the equivalent of 3 D. At the University Dispensary the lenses were marked "inches, French," which necessitated, at the writing of each of the orders sent to the optician, the calculation into 'diopters' by myself or my fellow-assistant.

Refraction by means of the Shadow Test or Retinoscopy, or, as Dr. Jackson called it, 'Skiascopy,' was being depended upon more and more in the hands of an increasing number of observers.

It was often caustically discussed as to the necessity of prescribing the full measures of the defects, both hyperopic and myopic. And, just how much should be withheld in such "partial" corrections. Also, should glasses be worn constantly?

Along with problems connected with Refraction was considered that of the propriety of using in all cases what was spoken of as a 'mydriatic,' in reality, a "cyclopegic." Few then were hardy enough to advocate their use in adult eyes. Atropia was the first to be employed, but as the effects of belladonna seldom passed off under a week or ten days, other effective, quick-acting alkaloids were sought, and Homatropine, Dubosia, Hyosine, Hyoscyamine were the substitutes experimented with.

In the study of excised tissues, the methods, both gross and histologic, were only those of the general pathologist. It was soon demonstrated, however, that the delicate elements required other methods to bring out minute details.

The influence of the Section soon became manifest. By the publication of the papers and reports presented at the meetings in the general journals and in the Knapp's Archives, founded in 1869; the Ophthalmic Record, 1891; and, the American Journal of Ophthalmology, 1894. And, they were accepted, in whole, or in part, or in abstracts, by European Journals. Of signal importance was the issue, in 1893, by Dr. de Schweinitz, of "Diseases of the Eye," 'a handbook of ophthalmic practice'—an epitome of the accepted teaching at the time of the founding of the Section.

This is but a superficial and desultory survey of the status of Ophthalmology of the period when the Section was founded. Much has been omitted lest you be bored and wearied. The improvements in operative surgical procedures; the removal of foreign bodies in the globe; traumatisms; the increasing usefulness of the Perimeter; and therapeutics; can only be mentioned.

The last decade of the 19th Century was the end of what might be called the "period of clinical intuition"; during which much was accomplished by the men and women engaged therein, although only by their mechanically unaided powers. The examination of the eye and its functions had been almost solely by the individual's powers of observation, but, from then on, by the invention of precision instruments and the developing of intense laboratory experimentation, the founders of the Section, their successors and their guests carried the Section to the forefront of American Medicine.

Rummaging in the Museum

IV

Our Old Shoes*

By JOSEPH McFARLAND, M.D.

Curator[1] *of the Mütter Museum, and Fellow, of the College of Physicians of Philadelphia*

THE "Herr Lieutenant" awaited me at the house door. He was a middle-aged man, somewhat foppishly dressed "in mufti," for though he had spent all of his early years as an officer in the German army, he had foolishly married an impecunious "ballerin" who brought him no *dot*, and so had not only ended all his hopes of promotion, but of his military career as well. He was therefore, "ausser dienst," and glad to let rooms in his somewhat extravagant apartment on the Anlage, to students in the University of Heidelberg, especially to Americans, of whom I was one.

As I joined him he regarded my well polished shoes with undoubted envy, and caught in the act, as it were, began to excuse himself by remarking in fair English, "Ja, there must be a difference in the method of finishing leather in America. Your boots are, of course, not so strong and durable as ours, but they polish much better." I laughingly reminded him that the shoes I had on were not American, but had been made in Heidelberg by a shoemaker on the Hauptstrasse, to whom he had recommended me. A dark look then marred his face as he continued, "So, I understand, but you are spoiling Sophie by giving her too much *trinkgeld*. You see she polishes your shoes much better than mine. I must stop that."

Again I laughed and begged him not to scold the "dienst mädchen," as she had nothing to do with it for I had polished my shoes myself. To this he replied, "Ach Gott, ein Herr putzt seine eigene stiefel?"

"Certainly," I replied, "in America all of my friends polish their own shoes." And then thinking to amuse him I briefly related the story of President Lincoln who once when visited by an important personage was caught in shirt sleeves, polishing his shoes. "Why Mr. President," said the astonished visitor, "are you polishing your own shoes?" "Why yes," said Mr. Lincoln, "whose did you think I was polishing?"

The Lieutenant missed the point and asked, "Are there then no 'mägde' in America?"

"Certainly," said I, "but they don't polish shoes."

He was silent as we began our walk toward the old castle on the hill, and then as though suddenly inspired by a convincing argument, demanded, "What do you do when your boots are too muddy for you to be able to clean them yourself, then you have to give them to the maid, nicht?" "Well," said I, "my boots have never been so muddy that I could not clean them, but the dirtier they might become, the less willing would I be to give them to a girl to clean." He said no more but as we continued to walk I could feel his growing contempt for any man capable of performing so menial an act when there was a "Mädchen" to do it for him, and I thought with sympathy of poor Sophie, a homely and none too cleanly young woman who worked from early morning to late at night, for very little money, with never a moment to herself, never a word of encouragement and with nothing to look forward to.

From this perhaps too long reminiscence it may be inferred that my feelings toward women are somewhat chivalrous and that it pains me to see them subjected to humiliating tasks.

You may, therefore, imagine the surprise and dismay with which my associate, the "clerk-technician" of the Mütter Museum, in answer to my question, "Well, what did you do yesterday?", responded, "*I spent most of the day cleaning shoes!*"

* Read, June 10, 1943, at a dinner given at the College of Physicians of Philadelphia for the Regional Meeting of Medical Librarians held at the College, June 10–11.

[1] On June 1, 1943, after this paper had gone to press, Dr. McFarland became Honorary Curator, and the Clerk-Technician, Mrs. Ella N. Wade, Curator, of the Mütter Museum and College Collections. [Ed.]

I had a momentary vision of an elevated arm chair upon which some dignitary of the College sat temporarily enthroned, his feet upon metal supports, while Mrs. Wade upon her knees daubed on polish and rubbed vigorously until his shoes shone! No, that was unthinkable! What did she mean?

"Cleaning shoes? What shoes? Where?"

"Our old shoes in the case in the lower room, and they needed it, for moths had gotten into some of them."

As I was marvelling that moths should get into shoes, it dawned upon me that she referred to a gift to the Museum made in 1907 by Dr. H. Augustus Wilson, late Professor of Orthopedic Surgery in the Jefferson Medical College. The collection is not of "shoes" only, but of sandals, clogs, shoes, boots and socks—, in fact of footwear—in all the diversified forms in which it makes its appearance in different countries.

I must have glanced at that case of shoes a hundred times with no other interest than to see that the arrangement was orderly and the objects free of too much dust. What interest could there be in shoes? It never occurred to me that it might be absorbing and I should eventually fall under the spell and haunt libraries, read old dusty volumes, and visit museums to see what shoes were shown in Egyptian, Babylonian, Assyrian, Hittite, Greek, Roman, Mexican and Mayan art, or that I should pester my archeologist friends with questions they could not answer and upon which they declined to speculate.

It is amazing what a change in one's attitude toward anything can be brought about through curiosity and interest. To those old shoes in the museum case I had been totally indifferent for years. I knew that they were there, that many were curious, some beautiful, some dilapidated, some suffering from depredations of pests, and I had several times suggested that they should be dusted, but that was all, and if anyone had told me a month ago that I would experience a sudden enthusiasm that would lead me to special correspondence with anthropologists, to pilgrimages to various libraries to read up upon them, and to speculate about the origin and purpose of shoes in general, I should have been amused.

But, what are shoes? What are they for? What were they originally for? By whom were they invented? Why? When? Where? These are the inevitable questions that arise concerning any objects of particular interest, and the same answer must be made in each case, they are products of *evolution*. Undoubtedly, but how did they happen to evolve?

Perhaps some suggestions might be found in an examination of the existing shoes and of the functions that they are supposed to perform. It seems simple enough when first suggested, but it becomes overwhelming as one proceeds. It is as if one should set out to determine the evolution of insects by an examination of all of the different butterflies, dragonflies, beetles, bees, wasps, flies, fleas, lice, bugs, ants, maggots and caterpillars by which he is surrounded. If intelligent, but possessed of no special knowledge of how to go about such an investigation, he would probably proceed to separate the simple from the complex, and continue by culling out the more simple until only one, the most simple was left, deducing that insect life probably began with that insect. It would be an egregious blunder for at least two reasons. First, because the insects that were considered are only the contemporary forms, whereas millions of years, and billions of generations of insects antedated them, including hundreds of families, genera, and species of fossil insects unknown to our investigator, and they in turn by as many others that can never be known because their perishable bodies have disappeared leaving no trace behind them. Second, because some of the varieties that he observed and regarded as primitive, were once as complex as any, but have become dispossessed of their once useful appendages and ornaments through the adoption of some new mode of existence, as, for instance, when a winged insect loses its wings upon assuming a parasitic mode of life.

A competent paleoentomologist may point out many extremely simple and primitive insects, but he will never commit himself as to the actual beginning of insect life.

If an attempt be made to search for the origin of shoes by the same method, the same difficulties will be encountered. Think of the great variety of contemporary footwear, some useful some useless, some aristocratic some plebian, some plain some ornamental, some expensive some cheap, but all expressions of a long established and highly developed industry, and you will understand.

If you imagine that human documents will aid in the discovery of the first appearance of

footwear, only disappointment awaits you as regards final results, though it is quite probable that with your pursuit of the subject, your interest will grow.

In going back through the succession of great world empires, Rome, Greece, Persia, Assyria, Babylonia and Egypt, well-developed footwear, in great variety and interesting forms, is found in each.

For example, the Cyclopedia of Costumes Vol. 1, p. 459 contains a plate on which have been gathered together, from statues, friezes etc., nine different varieties of shoes worn by the ancient Romans. But they are far from primitive, all being complex and some highly ornamented.

Footwear, of course, must include hosiery which may have originated with the Romans, for one of their articles was the *sock*. Now, I firmly believe that I know what a sock is, for together with all my male friends, I have always worn such short hose of wool or silk modestly concealed under my trousers. I have, however, lived to see them become shortened, and turned down upon the shoes to assist in the exposure and glorification of the shapely limbs of adolescent girls!

With this in mind it is a surprise to learn that a sock (soccus) was in the days of yore (i.e. the Roman Empire), a "plain kind of shoe sufficiently large to receive the foot with the caliga, crepida or any other kind of shoe upon it." It was an *overshoe!*

The Romans were somewhat partial to "*buskins* (Cothurnus) or short boots that laced up the front of the legs, in some instances covering the toes entirely; in others a strap passed the great toe and the toe next to it connected the sole with the upper portions which met together over the instep and were from there laced up the front like the half-boots worn at present."

An interesting Greek dancing shoe that seems to be but little known was called the *Kroupeza* and took a variety of forms. Sometimes it was a double sandal with a small bellows in the heel which was thus elevated while the toe remained undisturbed; in other cases the bellows occupied the whole length of the foot so that both toe and heel were elevated. The little bellows actuated reeds, so that in the former case a whistling or musical note was emitted every time the dancer pressed upon his heel; in the latter every time he changed from foot to foot. The Greeks also had spiked shoes, *Caliza*, for the use of runners, just as we have.

Shoes sometimes assumed grotesque styles as is shown by the following; turn to the Cyclopedia of Costumes Vol. 1, p. 459, and you will read, "In the reign of Richard II the greatest extravagance in dress was indulged in by all classes, and the length of the toes of their boots, shoes and every description of chaussure, which had been moderate in the reign of his grandfather, now increased to such a length that they embarrassed the wearers in walking, and the points were fastened up the knees by cords or small chains." Then follows a quotation from the author of the "Eulogium"—"Their shoes and pattens were snouted and picked (piked) more than a finger long, crooking upward, which they call 'crackowes', resembling Devil's claws, which fastened to the knees with chains of gold."

The snout of one of these *crackowes* is shown in an illustration, and was six inches long and stuffed with moss. "Reduced, during the reigns of Henry IV and his son to moderate dimensions, they started out again with redoubled vigor in that of Henry VI and became, under the name *poulaines*, the subject of prohibiting statutes in the reign of Edward IV, at the close of which they disappeared,—let us hope forever." "Fashion, however, as usual rushed to the opposite extreme, and in the sixteenth century the shoes became as absurdly wide at the toe as they had previously been taper; and from the remarkable shortness of the upper portion, afforded scarcely any protection to the feet, the toes being barely covered by the slashed velvet or other material of which the shoe was composed." It is said that it again became necessary to suppress this monstrous development by legal enactment to prevent human feet from too closely resembling those of the duck.

Nor should we conclude the grotesqueries of these times without mention of the *chopines* which are shoes or sandals to which blocks of wood are fastened, usually at the toe and heel. It may be imagined that the primary purpose was to raise the foot out of the mud and filth of the streets, but it was soon discovered that the wearer's height was thereby increased, and the desire to be tall soon found expression in the height of the blocks until some of the chopines resemble miniature stilts. Some of them were beautifully ornamented.

Going back to earlier times I had an idea that something might be gained by a study of ancient inscriptions, faience, frescoes and papyri. I accordingly made excursions to the nearby museum

and looked at a great many. Of course nothing could be learned regarding footwear antedating the time at which the art objects were produced. The subjects represented upon the Greek, Etruscan and Attic vases and urns were usually mythological and it was interesting to see that when footwear was worn by the heroes or Gods, it was contemporary with the art work.

Let me call your attention to the marble statue of Aesculapius that stands at the first landing of our stairway. The god is represented wearing Grecian sandals.

Sometimes footwear is used in art in a figurative or symbolic sense as when Hermes has small wings or *pedila* attached to his sandals to suggest the rapidity of his movements. "Nor should the beautiful idea be lost sight of that he is also given a winged helmet, signifying that as he was swift of foot, so he was also swift of thought."

A plate from Rhodes in the University Museum is decorated with a painting of the combat between Hector and Menelaus, and shows both heroes wearing shoes. An Attic vase in the same museum shows a bare foot Hercules killing the lion. An Attic stela of the 4th century B.C. shows figures wearing sandals; an urn with red decorations shows the feet of some of the figures wrapped in bandages or puttees. The most interesting of the Attic paintings shows a man wearing buskins with long pointed toes, and tops, the fronts of which are drawn forward into long points that curve downward toward the toe and are nearly half as long as the foot.

An older Assyrian bas-relief of a lion hunt, shows five standing hunters armed with bows, each with feet encased in knee length boots (buskins?) with flexible soles, seeming to be laced up the front.

In the Harrison Rotunda I was interested to see that the Buddhist saints and their disciples were all bare-footed, but that the Chinese were shod. Loca Pala, a guardian King of the Tang Dynasty, wears what look like red sabots, but they may have been leather or silk.

In the Egyptian galleries most of the figures have bare feet, but a new idea appears, that of an ornamental anklet worn without sandals or shoes. Egyptian mummies wore "burial sandals," 350 years B.C.

There is in existence an Egyptian fresco of the time of Thotmes III, 1945 B.C. that shows a shoemaker and two assistants at work, so that it may be inferred that the shoe had attained a high degree of development in the culture of ancient Egypt. In that culture there developed an actual means of trampling one's enemy under foot and keeping him there. It was the so-called "*name shoe*," upon the inner surface of the sole of which, where it was in constant contact with the foot, it bore either the name of the enemy, or a picture of him.

Could the prophet Malachi have had something of the kind in mind when he wrote "and ye shall tread down the wicked; for they shall be as ashes under the soles of your feet. . . ."

If we turn to ancient America and go into the gallery where the Mayan sculptures are, we find ourselves in much the same kind of civilization, though it developed thousands of years later. On the "Vase of Chama" or Cary Vase, the figures seem to be without foot-gear of any kind, though one of the priests wears ornamental anklets, much like those seen on the Egyptian fresco mentioned above.

There are no documents earlier than ancient Egypt, but they leave us, as has been said, with a highly developed civilization in which there was a flourishing industry in plain and ornamental footwear. Where did it begin? When? Why?

I sought help from Prof. Irving Hallowell, of the Department of Anthropology of the University of Pennsylvania, and from him learned that—"Modern anthropologists have eschewed speculation about data. For the whole Paleolithic period, for example, which is the closest we can get to the beginning of things, there are no data on footwear because nothing has survived. For the later periods, we have the information that is recorded under 'clothing' or 'costume' in the monographs dealing with the people of particular regions.

"From my own knowledge I can only tell you this. There are many primitive peoples of the modern world who wear no foot-gear at all. This was true even of the Indians of British Columbia in aboriginal times. This suggests that certain branches of mankind never invented anything of the sort. Another established fact is that 'shoes' in the European sense arose in the circumpolar region where we have the so-called 'tailored clothing complex' (i.e. fitted garments as compared with the type of clothing in the classical Mediterranean world e.g. Roman toga).

"The moccasins of the northern Indians belong

to this complex as does the clothing of North Asia and Europe. But this whole complex is strictly northern. Indians of our South-west and South America did not use moccasins. Various types of sandal-like gear were employed. So, broadly speaking there are

1. The moccasin-boot-shoe-complex in the northern part of both hemispheres.
2. The sandal type of gear, and
3. The areas where no foot-gear is found."

So the investigation of the origin of shoes ends just as it did in the case of the insects. The beginnings are lost in an antiquity so old as to have left no documents and no relics. Anything still to be said upon the subject must be mere conjecture.

It is, however, difficult to refrain from speculation upon so interesting a problem. At present footwear subserves at least three important functions:

1. It keeps the feet from being frozen by the cold.
2. It protects the feet from the trauma of the terrain upon which we walk.
3. It affords an opportunity for artistic expression.

It can easily be supposed that the third of these functions was the latest to develop, so we are left with the other two, and have to decide which of them may have been the first to show itself or whether they may have been simultaneous. It seems quite probable that the two may have arisen independently of one another whether simultaneously or successively.

The moccasin-boot-shoe-complex seems to have been primarily intended to keep the feet warm as it is found only in northern climates; the sandal type of foot-gear, to protect the feet from injury and keep them cool, as it is found in warmer climates. It may also be assumed that it was early found that protecting the feet from cold, also protected them more or less against trauma, so that the invention of the sole may not have been long deferred. But why in some hot countries the sandal ceases to be a sole and becomes attached to an upper is mysterious, unless the third factor, that of ornament came into play.

I have heard it said that the most untutored minds sometimes have flashes of inspiration that lead to great discoveries, and I not only believed it, but hoped that I might be in the way of making one as there flashed into my mind the thought that the invention of *gloves*, seemingly of minor importance as compared with shoes, and probably achieved much later, might lead the way to the solution of the problem. Yes, as the primary purpose of gloves and shoes seemed to be the same,—that of defending the hand from cold, and from possible injury inflicted by utensils,—the glove, if much later in development, might have made its appearance in historic times and thus open the way to an understanding of its beginning.

As a starting point we found that "Gloves were not worn in England before the end of the 10th, and the beginning of the 11th century." That seemed promising, and in eagerness we turn to the article "Gloves" in the Encyclopedia Britannica. It opens with the etymology and definition of the word, and then continues—"The use of gloves is of high antiquity, and apparently was known to the pre-historic cave dwellers." As it is impossible to go further back than that, and as that makes gloves and shoes contemporaneous as far as any knowledge of them goes, it seems unnecessary to say more about gloves. Thus,

> "The earthly hope men set their hearts upon
> Turns ashes. . . . ,"

and we must go on with the shoes.

From now on we shall strictly confine our attention to the collection referred to in the title of this paper as "Our Old Shoes." Perhaps the thought of *old* shoes may convey the idea of something repulsive as well as delapidated, but be not discouraged. No one has worn any of these shoes since long before Dr. H. Augustus Wilson presented them to us thirty-six years ago. The very newest must, therefore, be 36 years old, and the oldest, a pair of Egyptian burial slippers is more than 2000 years old. This certainly shows that they are "old shoes." But as such what interest can attach to them?

I can imagine somebody saying of me, "It is all very well for him to be interested in these shoes, for he is the Curator of the Museum and probably feels that he must occasionally write something to advertise it, but how can they interest us?"

How many of the readers of these lines realize that the Mütter Museum is one of the great medical museums, and that it contains many rare and valuable exhibits? Did you ever see these old shoes? Are they worth seeing?

Somewhere about 1896 there was a cordwainer's

celebration held in London, and in 1898 W. H. Dutton published a beautifully and photographically illustrated book showing reproductions of many specimens selected from the great exhibition of shoes of all times and peoples, brought together for that occasion. As historic specimens many were of surpassing interest because they had been worn by crowned heads and great men and women of all lands, but as specimens of shoes the former ownership is of no importance, except that the shoes of the wealthy were usually much more beautifully and expensively decorated than those of the poor. To assemble that collection, the South Kensington Museum and perhaps a dozen private collections were drawn upon. Dr. H. Augustus Wilson assembled the collection that he gave to us, all by himself. It is a one man collection, and yet it contains a very fair representation of almost every type of shoe shown in the exhibition mentioned above. He also gave with the shoes an album containing photographs of many of them. By comparing Dutton's atlas with Wilson's atlas, the value and importance of our collection may be measured and when that is done, our collection proves to be a very worthy one.

Before further details of the collection can be understood it may be worth while to refresh our memory with a few definitions:—

Shoe, "the ordinary outer covering of the human foot, usually not reaching higher than the ankle, and made of leather, suede, satin, etc."; *Sandal*, "a kind of shoe consisting of a sole without uppers, fastened by straps over the instep and around the ankle;" *Clogs*, "a kind of shoe consisting of a wooden sole to which the upper is fastened by tacks or nails;" *Patten*, "a flat wooden sole raised a few inches from the ground on a light iron frame with a ring-shaped base, formerly worn by women in wet weather. Any of the various wooden shoes." Tall pattens became the chopines to which reference has been made; *Boot*, "a leather covering for the foot and lower part of the leg;" *Bootee*, "a little boot, a lady's or child's light boot or half boot;" *Buskin*, "a kind of laced boot or high shoe with a thick sole, worn by tragic actors and used as the symbol of tragedy; also called cothurnus;" *Sabot*, "a wooden shoe worn by poor farmers." Some of these were also worn by the better classes and were carved and decorated. The term is also applied to a kind of wooden sole with a leather top (clog); *Slipper*, "a low comfortable shoe for indoor wear:" *Mule*, "a slipper with neither quarter or (formerly) heel;" *Upper*, "the part of the boot or shoe above the sole." It consists of the—*Vamp*, "the part of a shoe just above the sole, covering the toes and extending to the sides," and *Quarter*, "the part of the upper between the vamp and the back-seam."

In our collection there are 111 varieties of footgear of which 107 may be spoken of as shoes and 4 as hosiery.

Of the former 73 are paired and 34 single representatives, and among them are 18 pairs and 6 single sandals; 5 pairs and 1 single boot; 14 pairs of clogs; and 36 pairs and 27 single shoes. The specimens pretty well cover the geography of the world. Eleven are from North Countries—Siberia, Russia, Norway, Sweden, Holland, Shetland Islands, Alaska. Thirty-nine are from Temperate Countries,—France, Belgium, Austria, Spain, Morocco, Malta, Madeira Islands, Syria, Tunisia, North America, Korea, Japan, and China. Twenty-three are from Tropical Countries,—Egypt, Abyssinia, East and South Africa, India, Java, Philippine Islands, Arabia, Mexico, Venezuela and Bolivia.

Some are extremely simple and plain, others elaborate and highly ornamented, some are extremely light, others so heavy that one wonders how they could be carried about without fatigue.

Of the ornamented specimens the embroidered silk shoes from China, Abyssinia and India, the inlaid clogs from Morocco, the tooled shoes from the Philippine Islands, the beaded leather moccasins of the North American Indians, the painted leather shoes from Tunisia and Arabia, the decorated leather shoes from Java should be examined.

Of particular interest are the fur and stitched boots of the Esquimaux—it was of these of which the clerk-technician spoke when she said, "and some of them have moths in them."

Perhaps the most curious examples in the collection are the Egyptian burial slippers, the African clogs with the toe-posts, the tiny embroidered satin shoe to fit the deformed bound foot of a Chinese lady, and the leather sandals worn by pilgrims on their way to Mecca.

In the minutes of the Museum Committee in which the acceptance of the gift is recorded, the secretary seems to have omitted a punctuation point by which the meaning is left somewhat uncertain. It says that "Dr. H. Augustus Wilson presented a collection of shoes from all parts of the world of interest to orthopedists." Come and see them and then decide whether it is the shoes or the parts of the world from which they came

that are of interest to orthopedists. I cannot be sure.

As I consider all these different types of shoes, I realize that I would have to be an orthopedist to appreciate any special interest they may have for orthopedists, though while remaining a pathologist, I can fully appreciate the historic, romantic and artistic interests of the exotic countries from which they have come so that there has arisen within me a passionate desire immediately to visit them all. Shall I explain this feeling as

The Call of the Shoes?

Transactions of the Sections

SECTION ON GENERAL MEDICINE

Joint Meeting[1], *May 10, 1943*

The Treatment of Myocardial Infarction. Clarence E. de La Chapelle, M.D.

Pain of Esophageal Origin Simulating the Anginal Syndrome. Joseph Edeiken, M.D.

The Status of Electrocardiography in Cardiac Diagnosis. Charles C. Wolferth, M.D., and Mary Miller Livezey, M.D.

SECTION ON OPHTHALMOLOGY

DINNER MEETING[2], APRIL 3, 1943, IN OBSERVANCE OF THE 50TH ANNIVERSARY OF THE SECTION

Ophthalmology in Philadelphia in the Early Eighteen Nineties[3]. Burton Chance, M.D.

Reminiscences on the Founders of the Section. William Zentmayer, M.D.

The Development of Recognition of the Specialties in the "Organic Law" of the College. W. B. McDaniel, 2D.

Regular Meeting, April 15, 1943

Juvenile Macular Exudative Choroiditis. Francis H. Adler, M.D., and Hunter Scarlett, M.D.

Post-traumatic Ptosis, Probably Hysterical: Case Presentation. Edmund B. Spaeth, M.D.

Restoration of Abduction in Traumatic External Rectus Palsy, with Report of Two Cases. H. Maxwell Langdon, M.D., Van M. Ellis, M.D., and R. D. Mulberger, M.D.

Concerning Malignant Melanoma of the Choroid. Perce De Long, M.D., and Philip L. De Long.

SECTION ON OTOLARYNGOLOGY

Joint Meeting[4], *April 21, 1943*

A Correlation between Vestibular Function and Hearing in the Profoundly Deaf Child. Mary Frances Vastine, M.D. (Commentator: Walter Hughson, M.D.)

A Review of the Etiology of Ménière's Symptom Complex. E. Downes Longaker.

Exhibition of the Hearing Aid Collection of the Mütter Museum. Douglas Macfarlan, M.D.

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

Meeting, April 5, 1943

THE PRESENT PROBLEM OF CONTAGIOUS AND VENEREAL DISEASE CONTROL IN PHILADELPHIA

The Civilian Problem. Hubley R. Owen, M.D.; Norman R. Ingraham[5], M.D.

The Problem in the Armed Forces. C. J. Buckley[5], Lt. Comm., MC, U.S.N.; Harold B. Damron, Major, MC, U.S.A.

[1] With the Philadelphia Heart Association.

[2] Held at the College.

[3] Printed in this number of the *Transactions & Studies*.

[4] With the Philadelphia Laryngological Society.

[5] The paper of this speaker was printed in the April, 1943, number of the *Transactions & Studies*.

A Note on Thomas Hodgkin and a Philadelphia Society

By O. H. PERRY PEPPER, M.D.

Professor of Medicine, University of Pennsylvania; President, The College of Physicians of Philadelphia

IN SIR WILLIAM HALE-WHITE'S[1] delightful biography of Thomas Hodgkin, mention is made of his membership in scientific societies in many parts of the world including Rome, Siena and Philadelphia. This naturally arouses one's curiosity as to which Philadelphia society it was and why. Hale-White refers the reader to the title page of volume II of Hodgkin's "Lectures on the Morbid Anatomy of the Serous and Mucous Membranes" published in 1840. Here the list is longer than in volume I which had appeared four years earlier without mention of any society in Philadelphia.

When one turns to volume II one finds that it was not The College of Physicians, The Philadelphia County Medical Society, The Pathological Society or the Philadelphia Medical Society which had honored Thomas Hodgkin or been honored by his membership. These were the important medical societies of Philadelphia in existence in the appropriate years of the middle half of the nineteenth century; but, unexpectedly as it may seem at first glance, it was the Academy of Natural Sciences of Philadelphia to which he was elected a corresponding member in 1837, at the age of 39. This membership is, however, in keeping with others for the list reads as follows: "Member of the Lyncean Academy of Rome, The Physico-Critical Academy of Siena, The Philomathic Society of Paris, The Royal Society of Medicine of Marseilles, The Society of Medical and Natural Sciences of Brussels, The Medical Society of Ghent, The Society of Natural Philosophy and Medicine of Heidelberg, The Academy of Natural Sciences of Philadelphia, The Massachucetts' (sic) Medical Society, The Geoenian Society of Catanea, The Iatrophysical Society of Palermo, The Sandwich Islands' Institute, etc., Licentiate of the Royal College of Physicians in London, Formerly Lecturer on Morbid Anatomy at Guy's Hospital."

In this group, the Academy of Natural Sciences finds itself with some strange bedfellows but the explanation is perhaps simple. Hodgkin was a strict Quaker and interested in good works; even as a young man he wandered from medicine into the fields of philology, ethnology and anthropology. In fact, while still a Lecturer at Guy's Hospital, he founded The Aborigines Protection Society. Already his list of Societies is easier to understand and when one adds his abandonment of clinical medicine following his failure to be appointed to the clinical staff at Guy's Hospital and his close friendship with the famous Jewish philanthropist, Sir Moses Montefiore, the picture is complete.

Possibly a psychologist might read into this list of foreign Societies an effort to balance the tragedy revealed by the word "Formerly" in the final line. More charitably, one may think of his wide and varied interests outside the limits of medicine. Whatever the explanation, the fact is that one of the famous figures of medicine was elected to the Academy of Natural Sciences and not to the College of Physicians which would today appreciate far more the honor of having the name of Thomas Hodgkin on its roll of members.

[1] Guy's Hospital Reports, 74: 117, 1924.

First Report of the Honorary Director of the Department of Medical Art

Library Committee,
College of Physicians of Philadelphia

Sirs:

From the standpoint of record the Department of Medical Art of the College of Physicians of Philadelphia was instituted by Dr Edward B. Krumbhaar in 1940 during his term of office as President of the College.

Dr Krumbhaar in May 1940, while discussing various phases of the work of the College with Dr Balduin Lucké, referred to the prints, photographs, and miscellaneous historical material in the possession of the library. Dr Lucké was cognizant of the hobby of his friend Dr Samuel B. Sturgis, who had just donated to the College a collection of the work of the Fabers, a family of medical artists. On this occasion he suggested to Dr Krumbhaar the possible value to the College if the services of Dr Sturgis could be obtained for arranging these collections in the library. With this end in view, Dr Krumbhaar and Dr Wm Egbert Robertson, chairman of the Library Committee, visited Dr Sturgis at his home in Ardmore and inspected his methods for the care and preservation of prints. They felt that his system would be applicable to the library collections.

On June 5, 1940 a letter was sent to Dr Sturgis by Dr Robertson, which read in part:

"The Library Committee of the College voted unanimously to accept your collection of medical art by the Fabers, father and sons, and welcomed the information that you had undertaken to gather for the Library a representative collection of medical art in the various meanings of the term. It was the sense of the Library Committee and the Council of the College, that you be asked to accept the title of Honorary Director, or Curator, of the Collection of Medical Art."

After receiving this letter Dr Sturgis accepted the duty of assembling these collections of the library. Work was started immediately to arrange the material. Valuable assistance was given by Mr W. B. McDaniel, 2d, librarian of the College. His assistance has been most stimulating and his advice most valuable. The laborious detail of this work has been relieved greatly by his most willing cooperation.

The material is extensive and varied. Much time has been required for completion of this work. It was deemed best to complete properly the material on hand before other objectives of this department could receive attention. The account of the completed portfolios which follows in this report will convey to you the amount of work that has been accomplished. During this period the collection has been increased both by gifts and by exchange. Special note should be made of the gift of Dr S. McC. Hamill of approximately 400 prints. Col. Harold W. Jones, Librarian of the Army Medical Library, Washington, D. C., is at present separating all duplicate prints in the Army Medical Library for exchange with the library of the College. Hence our efforts to date have been of definite value to the collection.

The arrangement of the material is assuming form. Much detail work remains. When this is completed, new phases of the department will receive attention.

A chart of the collection follows:

	Prints[1]	*Photographs*	*Original Documents*	*Misc.*[2]	*Totals*
1. Coll. Phys. Phila.					
Buildings		89		81	170
Certificates of Membership			32		32
Historical Documents			34		34
Meeting Notices, etc.[3]					
2. Portraits					
Single	1,352[4]	1,071		2,942	5,365
Group	1	53		86	140
3. Medical Buildings	28	47		155	230
4. Clinics, Lectures, etc.	1	21		85	107
5. Other Historical Medical Subjects	29[5]	22		95	146

	Prints	*Photographs*	*Original Documents*	*Misc.*	*Totals*
6. Historical Medical Documents			34		34
7. Certificates of Membership					
Medical Soc.			39		39
Non-med. Soc.			19		19
8. Matriculation Cards			160[6]		160
9. Medical Celebrations			68		68
10. W. W. Keen Collection[7]			58		58
11. Sculpture, Medals, etc.	22	26		124	172
12. Caricatures (medical)	9			61	70
	1,442	1,329	444	3,629	6,844
Additional mounts in elephant portfolios[8]	14	10	46	32	102
Totals	1,456	1,339	490	3,661	6,946

[1] That is, engravings, by the various methods, on copper and steel, and lithographs; these are mounted and kept in portfolios.

[2] This classification includes media other than original prints and photographs: photostats, newspaper and magazine clippings, etc., mounted in bound volumes in the manner of a scrap-book.

[3] These are contained in a loose-leaf volume not yet completed. The volume will be kept up-to-date and thus serve as a continuing and permanent file of this ephemeral material.

[4] Includes 45 of the prints listed in Stauffer's "American Engravers on Copper and Steel".

[5] Not yet completed.

[6] Contained on 35 mounts.

[7] The foresight of Dr Keen in preserving material of potential historical interest has made possible this portfolio, which contains many interesting historical records.

[8] The elephant portfolios, unlike the small and medium ones, do not contain material divided by subject-classes and media, but by the media of production only; that is, one elephant portfolio contains the large original prints and photographs; another, original documents; the third, miscellaneous material—each portfolio containing representatives of several subject classes.

These items are arranged in portfolios and bound volumes, marked according to the various classifications, as follows:

Portfolios (small)	60	
" (medium)	18	
" (elephant)	3	81
Bound volumes (small)	24	
" " (medium)	5	29
Total of portfolios and bound volumes		110

The dimensions of these three mounts are: Small—cardboard 17½″ x 11¼″; Medium—cardboard 22½″ x 14¼″; Elephant—cardboard 28½″ x 22½″.

The various portfolios are of such size as to hold approximately 75 completed mounts in each portfolio.

In addition to the above there are 12 completed portfolios containing the Faber Collection donated previously in completed form by Dr Sturgis. The entire collection has been given the name as follows: Sturgis Collection of Medical Art of the College of Physicians of Philadelphia. The collection is housed at present in cabinets in the Packard Room, adjoining the library of the College.

DISCUSSION

The above collection is a most representative collection of valuable historical medical material. The number of prints of portraits is most satisfactory. In assembling the material special note was made of the source of acquisition. The College is indebted to many Fellows and friends for much of this collection. Special note is made of the gifts of Drs. W. W. Keen, A. P. C. Ashhurst, G. E. de Schweinitz, A. P. Brubaker, J. M. Anders, W. N.

Bradley, Francis R. Packard, Edward B. Krumbhaar, Burton Chance, Samuel McC. Hamill, and of Mrs J. Hampton Carson and Mrs Erwin F. Faber.

The assembling of this collection has been performed with no financial expenditure by the College. The labor, supplies, portfolios, and much material have been donated to the College by the Director of this department.

This department has still work to perform. There are at least 200 more photographs, etc., to be incorporated into this collection. It is hoped that this report will stimulate Fellows to make donations and to forward their own photographs to be incorporated into the collection. When this phase of the work is completed attention will be given to such phases as medical drawings and illustrations, book-plates, etc. Eventually this collection will be most comprehensive and will serve a purpose in the valuable work performed by the College.

Respectfully submitted,
SAMUEL B. STURGIS,
Honorary Director,
Department of Medical Art,
College of Physicians of Philadelphia

June 2, 1943

Report on the Regional Meeting of Medical Librarians

LIKE many other national societies, the Medical Library Association, of which the College library is an institutional member, and several of its staff professional members, decided to forego its annual meeting this year. However, interest in maintaining professional contacts was so pronounced among medical librarians of this region that Miss Mildred Naylor, librarian of the Academy of Medicine of Northern New Jersey, arranged for a regional conference on June 10–11, which, at our library's invitation, was held in the College building. Any reservation as to the propriety of holding such a meeting in these times was quickly dispelled by the remarkable attendance and spirit of the meeting. It was made very apparent that these conscientious and hard-working allies of the medical profession came to the meeting not in the usual carefree convention-spirit, but with two serious purposes in mind: 1) furtherance of their professional capacity; and 2) momentary respite, in congenial professional surroundings, from the personal stresses of the daily routine. The meeting was a forceful lesson to some of us that it may not always be wise to disregard, even in wartime, the morale-building potentialities of such regional gatherings.

The meeting was in no sense an official meeting of the Medical Library Association; a number of those attending were not members of the Association and had never attended one of its annual meetings. The meeting was held in an atmosphere of informality befitting the times. Yet it is reasonable to hope that, after the war, it will be found to have been a not-unimportant factor in keeping alive the splendid spirit of camaraderie that has always characterized this Association.

Miss Naylor succeeded somehow in providing a program that was remarkably comprehensive and interesting. On the first morning, following a moving Address of Welcome (printed below) by Dr O. H. Perry Pepper, president of the College, Dr John F. Fulton and Dr Henry E. Sigerist brought authority and their well-known personal charm to remarks on Vesalius, the man and his work, in commemoration of the four-hundredth anniversary of the *Fabrica*. The meeting then adjourned to the library for inspection of the Vesalius exhibit and more mundane aspects of the library's work. After a subscription lunch (attended by 47 persons) at the near-by Stephen Girard Hotel, which was capped by a brief talk by Dr Edward B. Krumbhaar, visits were made to the Pennsylvania Hospital and the Jefferson Medical College Library. At the former, Miss Florence Greim, assistant to the administrator, was our guide, illuminating with interesting anecdotes the many historical features of this beautiful building, the oldest hospital in the United States.[1] At Jefferson, our host was, of course, the genial Mr Joseph Wilson, long-time member of the Association, whose library was much admired.

In the evening, we dined at the College (54 being present) as the guests of Dr Charles W. Burr (the College's Honorary Librarian) and the library. After dinner (and a gracious bow from Dr Burr), we had the pleasure of listening to Dr Claude E. Heaton, of New York, whose subject was "A Reader Looks at Libraries"; and Dr Joseph McFarland, of Philadelphia, who read a paper entitled "Our Old Shoes" (printed in this issue of the *Transactions & Studies*).

On Friday morning we really got down to work. Papers were read by Miss Estelle Brodman ("Medical School Libraries"); Miss Mary E. Davenport ("The Hospital Medical Library in a Rural Community"); Mrs Ella N. Wade ("Care and Cataloguing of Medals"); Mr. J. G. Raymond ("Problems in a Large Medical Library"); Miss Helen Bayne ("Useful Aids in Reference Work"); Mr. Frank Place ("Records off the Record"); Miss Nora Lock ("Lantern-slide Cataloguing"); and Professor Charles W. David ("The Philadelphia Union Library Catalogue and Philadelphia's Movement toward Library Coöperation").

Following these papers there were informal reports from Mr Thomas P. Fleming, Miss Janet Doe, Mr. Charles Frankenberger, and Miss Naylor.

A subscription luncheon (49 present) at the

[1] The Philadelphia General Hospital (Blockley) ante-dates the Pennsylvania Hospital, but was originally an alms-house with provisions for medical care.

Stephen Girard was followed by visits to the medical library of the University of Pennsylvania, where our hostess was Miss Frances Houston, the librarian; and to the Osler Memorial Building on the grounds of the Philadelphia General Hospital (Blockley), where our host and guide was Dr. Jefferson H. Clark, chairman of the board of the Osler Memorial Association.

The meeting came to an end with a "valedictory tea and/or cocktail party" at the College; at this party we were all very appreciative guests of the Hahnemann Medical College library and its librarian, Mrs. Melitta Turner. The weather being favorable (as it was throughout the meeting), many availed themselves of the chance to inspect and stroll about the medicinal herb garden.

One feature of prime interest remains to be recorded: those gathered here were the first to hold in their hands a copy, fresh from the press, of what bids fair to become the medical librarians' bible, the "Handbook of Medical Library Practice" compiled by a committee of the Medical Library Association under the general editorship of Miss Janet Doe. This was Miss Doe's "informal report"—and a red-letter one it proved to be.

There follows a probably not complete list of those who attended one or more of the events briefly described above. An asterisk signifies that the person named signed the attendance book. The non-Philadelphians numbered 47, representing 32 institutions; the Philadelphians numbered 34, bringing to a total of 81 the number of those participating in the meeting.

NON-PHILADELPHIANS

*Angrist, Alfred A., M.D., Jamaica, L. I.
*Austin, Robert B., Washington, D. C.
*Ballard, James F., Boston
*Bayne, Helen, New York City
*Biethan, Sue, Ann Arbor
*Brinton, Margaret, New Haven
*Brodman, Estelle, New York City
*Carr, Elizabeth, New York City
*Collins, Mrs Raymond C., Rochester, N. Y.
*Davenport, Mary Elizabeth, Cooperstown, N. Y.
Dittrick, Dr and Mrs. Howard, Cleveland
*Doe, Janet, New York City
*Draper, Wesley, Brooklyn, N. Y.
*Evans, Lilian, Forest Hills, N. Y.
*Feeman, Thelma M., Danville, Pa.
*Finneman, Gertrude N., New York City
*Fleming, Thos. P., New York City
*Frankenberger, Mr. and Mrs. Charles, Brooklyn, N. Y.
*Fulton, J. F., M.D., New Haven
*Glatzl, Eugenie K., New York City
*George, Sarah W., New York City
*Gordon, Edith Ross, Montreal, Canada
*Heaton, C. E., M.D., New York City
*Henderson, Marjorie, Brooklyn, N. Y.
*Kahler, Mrs. Lorette C., Baltimore
*Lock, Nora, New York City
*McCann, Alice M., Pittsburgh
*Mahoney, Madeline P., Atlantic City
*Marriott, Beatrice, Baltimore
*Miller, Genevieve, Baltimore
*Murphy, Marion A., New York City
*Naylor, Mildred, Newark
*Nesbit, Maude E., Albany, N. Y.
*Nichols, Mrs. Josephine G., New York City
*Norris, Helen, Washington, D. C.
*Place, Frank, New York City
*Raymond, Jurgen G., New York City
*Riker, Minnie W., Newark
*Ruch, Coreina A., Pittsburgh
*Schramm, Elizabeth E., New York City
*Schwartz, L. L., New York City
*Sigerist, H. E., M.D., Baltimore
*Stewart, Harriett, Pittsburgh
*Walter, Mildred E., Rochester, N. Y.
*Wheeler, Helen, Baltimore

PHILADELPHIANS

Allen, Mrs. William H.
*Armstrong, Eva V.
Arnett, John H., M.D.
Austin, J. Harold, M.D.
Bailey, Margaret A.
*Baugh, R. H.
Bradley, William N., M.D.
*Breneke, Garth W.
Burr, Charles W., M.D.
*Coffman, Charlotte E.
*David, Charles W.
*Draeger, Ida J.
Fay, Marion
*Frankenberger, Amanda
*Haegele, Kathryn
*Hirsch, Rudolf
*Houston, Frances R.
Krumbhaar, Edward B., M.D.
*Lentz, Marjorie Kirby
*McDaniel, W. B., 2d
McFarland, Joseph, M.D.

*Manson, Clara
*Mars, Eleanor
*Meranze, D. R., M.D.
*Neiman, R. M.
*Palmer, Margaret Gayley
*Pepper, O. H. Perry, M.D.
*Purcell, William L.
*Shryock, Richard H.
Siefert, Ruth S.
*Turner, Melitta
*Wade, Ella N.
*Wilson, Joseph J.
*Yarger, Ruth

Some of the technical papers read at the meeting will doubtless be published elsewhere. As an appendix to this report we are privileged to publish Dr Pepper's Address of Welcome; the deep impression it made on those who heard it suggests that it should be made a permanent part of this report of the meeting. There is less excuse for the secondary appendix which follows it. While the publication of introductions of speakers is common enough, there would have been no thought of publishing any of these, had not a number of persons asked that they be printed. If they were to be printed at all, this seemed to be the appropriate time and place. It can only be hoped that, despite this transfer to a colder climate for which they were not fashioned, they may add an informative detail or two to this inadequate report of a memorable meeting.

Address of Welcome

By O. H. PERRY PEPPER, M.D.
President, The College of Physicians of Philadelphia

IT IS indeed proper that you should meet in this quiet Hall in these days when the urgency of the practical blacks out the wisdom of the past and the long goals of the future. From the walls look down on you, portraits of great men who kept medicine alive through the even darker days of the Revolution and the Civil War.

Medicine in all its branches is a war industry today and a highly efficient one; the science of medicine is in the war until the last wounded soldier is healed, the last sick civilian is restored. But the true soul of medicine is sleeping; it must not be allowed to die. We must each do what we can to keep the flame burning.

Where does the soul of medicine truly reside? Not in the clinic or the laboratory where the doctor is a slave to flesh or apparatus—not there, but in the calm of the stacks and studies, the reading rooms and halls of the medical libraries.

Here one feels the continuity of Medicine—its immortal soul transmitted from the past, held by us for our little moment to be cherished for our successors. Here one is reaffirmed to the everlasting ethic and discipline of Medicine.

It is in such libraries that the young physician meets the medical minds of the past and learns of their greatness and of their human weaknesses. Here I learned to verify statistics by discovering the confusing mathematical errors in Saussier's much quoted article on pneumothorax. Here I learned how a physician like Hieronymus Cardanus might anticipate science, by reading of his curing the asthmatic bishop by taking away his rose ball and his pillows. Here I learned that even great authors copy, without proper check, the errors of others by tracing the misspelling of poor David Bylon's name from book to book. These are trifling incidents but even so they bring one closer to the whole which is Medicine.

It is in these medical libraries that the flame is kept alight—you are its guardians. It is you who minister to the soul of Medicine. Yours is an essential task, especially in these days and it is a difficult one. You must avoid the same pitfalls into which the ministers to the human soul often slip. One counts only his converts or books, one withdraws from the world and would prefer his books not to be soiled by use. A perfect balance between incunabulophilia and a leaning toward ephemera, the monastery or the market place, is difficult to achieve.

Meetings such as this help you learn from one another how to gain such balance, how to sur-

mount the handicaps of these times, how best to carry on your ministry of the soul of Medicine.

The College of Physicians of Philadelphia welcomes you. Our College is proud of its history, its home, its library and its librarian. To him, the College entrusts the pleasant duty of being your host. May your meeting be enjoyable and profitable.

Introductions

INTRODUCTION OF DR PEPPER

EVEN so zoot-suit-y a gathering as this one must set forth on its way by putting either a left or a right foot forward. You will feel as I do, I know, that the right foot in this instance could only be a word of greeting from the distinguished president of this College.

Now, this gentleman himself says that, when duty calls, one may always expect to find him far behind. The starry-eyed Dr. Fishbein-Pepys, furthermore, has recently intimated something of this sort about our president. Against the weight of this evidence my word counts for little. But here it is, anyway. In the ten years I have known Dr O. H. Perry Pepper in a rather vague way, I have never known any one else more *attentive* to his duty, more considerate and gracious in the performance of it. I have the honor to introduce to you the president of the College of Physicians of Philadelphia, Dr. Pepper.

INTRODUCTION OF MISS NAYLOR

Honesty compels me to admit at this point that I stand here only as the temporary "front" for powerful but by no means sinister forces over which I have exerted only a weak control. The fact is that I have had relatively little to do with the arrangements for this rather sudden and exciting meeting.

On our front, Miss Manson, Miss Jackson, and all the other members of our staff have told me what to do and when. For instance, the sugar that you take with your tea tomorrow afternoon, should you elect to take it in that form, is by courtesy of my ration book. The less healthful offerings on that occasion, incidentally, are by courtesy of our colleague Mrs. Turner, and the Hahnemann Medical College library. Our local colleagues, as you see—Mrs. Turner, Miss Houston, Mr. Wilson, Miss Draeger, Miss Coffman, Miss Palmer, and others—have been wonderfully cooperative and eager to extend the traditional Philadelphia hospitality. It is to be regretted that visits to many points of interest have had to be postponed until you return in full dress, if you will, when the lights have gone on again and gaiety need not be too suspect.

But it is no secret that Miss Mildred Naylor invented this meeting. It was she who devised the program, captured most of our notable speakers, mimeographed the announcements and programs, selected the menus, and, I fancy, carried on a correspondence that would have blanched the cheeks of any ordinary person. Our entente is so cordiale, in fact, that we have even found a formula regulating the introduction of the speakers. In a moment I shall introduce Miss Naylor to you somewhat informally.

Before that, however, I have two or three brief paragraphs to complete.

First, a message that will please you, I know. It goes as follows:

"Please convey my warm regards to all the boys and girls and if you feel a breeze over your left shoulder, never mind,—for it will only be my spirit, which you may be sure will be with you all. I am told I am not allowed even to send a telegram of greetings nowadays, so this desolate moan for lost opportunity will have to serve.

Cordially yours,
Mary Louise Marshall[2]"

This meeting will, I hope, prove to have more than one claim on your memory in the distant future. Among the claims, I am sure, will be the fact that it was at this moment, in all likelihood, that you first set eyes on the living, breathing, "Handbook of Medical Library Practice", Janet Doe, editor, bless her heart.[3] Here it is—this miracle of parthenogenesis, for, you see, no male name defiles its list of contributors. It has a very

[2] President of the Medical Library Association.

[3] The presentation of the *Handbook* at this point was a regretted faux pas on the part of the speaker, who had forgotten that Miss Doe had a report to make on the following day—the book, as it turned out, being her report.

slight typographical miscarriage on the title-page, which only a rejected suitor would be graceless enough to notice. Aside from this insignificant birthmark, it is sound of wind and limb, and the Drs Fulton and Sigerist have got to be good to top it. And so, I'm afraid, have you, Miss Naylor.

INTRODUCTION OF DR KRUMBHAAR

Immediately preceding Dr Pepper as president of the College of Physicians of Philadelphia was a man who is known personally to many, and his name doubtless to all, of you. A pathologist, teacher and head of a department of pathology, editor of a rather well-known yellow journal, in his spare moments—in what never, never-land he finds them, I don't know—he thinks nothing of tossing off a translation of an 800-page Italian history of medicine.

For a decade now—both of us being obstinate as hell (only he won't admit, of course, to the soft impeachment)—he has been patiently and valiantly trying to make your humble colleague see the light. There is no one else in the circle of our professional interests that I could introduce to you with quite so much pride and affection, if he won't mind my saying so, as Dr Edward B. Krumbhaar.

INTRODUCTION OF DR HEATON

One day last summer, as our school themes used to begin, a member of our staff saw a reader holding a periodical in the air and cutting the leaves with a pen-knife. (Out of bigness of heart, he had been allowed to consult the issue before it had been collated.) With true missionary zeal, our assistant rushed over, collected himself, and politely ventured the suggestion that the project could be more easily accomplished if the victim were laid flat on its back. To which the constant reader replied, "Oh, that's just the librarian in you!"

We all, I daresay, have our private folders with a code-label translatable as "Librarian looks at reader". Those of us who remain young at heart know very well that there is another side to the story.

Dr Claude E. Heaton, of New York, is, as you know, an obstetrician and a medical historian. He frankly warned us that the unpredictable factors in his labors might prevent, at the last moment, his participation in our evening service. I am very happy to see, as I know you are, that Dr Heaton has not availed himself of the best alibi at the disposal of the medical profession. We've got him now—because, before he could get back to New York, one of those taxi-drivers would have done him out of his job.

Dr Heaton gives us the other side of the picture—"The Reader Looks at the Librarian".[4] I hope he'll be tough, but I fear he won't. He's a charming gentleman, and a scholar. Dr Heaton.

INTRODUCTION OF DR MC FARLAND

We freely acknowledge that librarians don't read. But there are unethical members of every profession, and it is just possible that there are some here who have surreptitiously followed in our *Transactions & Studies* a series of articles bearing the general title "Rummaging in the Museum". Under this rather unprepossessing heading there have appeared articles of wit, fact, and fancy subtitled "A Reconstruction of 'Pile' "; "The Petrified Lady"; "The Dead Chinaman"; in press at the moment is another, which you are about to hear: "Our Old Shoes".

The author of these provocatively entitled articles, which have won a select and highly appreciative following, is the rummager in the museum himself, Dr Joseph McFarland, Honorary Curator of our Mütter Museum, whose chambers of horror you have probably already visited, or, if you haven't, certainly will tomorrow.

An eminent pathologist, as you know, Dr McFarland is that rare bird, at least in our country—a scientist with a silver tongue. I keep forgetting to ask him whether it's Irish mixed with Scotch, or vice versa. At any rate, as editor of our *Transactions & Studies*, (not as librarian, mind you), I read avidly every word he is kind enough to send in to us. His copy sometimes sports typographical eccentricities due, I suspect, to the artistic temperament. How silly such witless observations seem in the face of the rock of integrity and the fire of eternal youth. Dr Joseph McFarland.

INTRODUCTION OF PROFESSOR DAVID

We with a special library field to cultivate are becoming increasingly aware that our field is not isolated—that we have neighbors, and that the time is coming when we must more and more think

[4] This was the title listed on the program. Dr. Heaton explained at the beginning of his talk that he had intended the title to read, "The Reader Looks at Libraries".

of a community's libraries as chapels in a single great temple to which all the community may come for assistance and guidance.

Knowing something, as perhaps others of you do, too, of our Philadelphia Union Library Catalogue, Miss Naylor made the happy suggestion that one paper on this morning's program concern itself with this larger aspect of library work. Now, the Philadelphia Union Library Catalogue is but the beginning of a slow but sure volcanic movement in our city's cultural concepts. The god of the volcano has graciously consented to be present this morning and to emit a few of the eloquent rumbles that are shaking our foundations: Charles W. David, Doctor of Philosophy, Professor of History, and Director of Libraries, of the University of Pennsylvania.

W. B. McD., 2d

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Some Modern Conceptions of Amebiasis*

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INTRODUCTION

IN 1875 a Russian physician, F. Lösch, first observed and described the active stage of *Endamoeba histolytica* in the dysenteric stools of a patient, and at necropsy found motile amebae in material obtained from ulcers of the colon. Moreover, he succeeded in infecting one of four dogs inoculated with amebae present in the bloody-mucous exudate of the patient. Yet Lösch failed to appreciate the rôle which his "Amoeba coli" played in the disease with which it was associated. The studies of Koch (1883) and of Kartulis (1886, 1887) in Egypt, of Hlava (1887) in Prague, of Osler (1890), Stengel (1890), Musser (1890), and Dock (1891) in the United States provided uncontestable evidence that the ameba discharged in dysenteric stools was causally related to amebic colitis, while Quincke and Roos (1893), Huber (1903) and Schaudinn (1903) demonstrated a cystic stage of the parasite. Meanwhile Councilman and Lafleur (1891) had provided a basic pathological study of amebiasis and in 1913 Walker and Sellards demonstrated experimentally in human volunteers in the Philippines that the disease was produced by feeding cysts of *Endamoeba histolytica*, while infection without disease resulted from feeding cysts of *Endamoeba coli*. By 1924 Boeck and Drbohlav (1925) had perfected a technic for the *in vitro* cultivation of *E. histolytica* and by 1927 Craig had demonstrated specific complement-fixing properties of *E. histolytica* antigen.

During this period of approximately fifty years the ideas that amebiasis was strictly or primarily a tropical disease and usually manifested itself as a fulminating dysentery or a liver abscess became gradually modified. Little by little, as epidemiologic studies were carried out, the discovery was made that amebiasis is practically cosmopolitan in its distribution, although as a rule its incidence is higher and its clinical expressions are more severe in the Tropics than in cooler climates. Dysentery and liver abscess were found to be only two of its more dramatic manifestations. There might be a history of an acute or subacute appendicitis, or of general colonic distress without dysentery or even without diarrhea. There might be no apparent intestinal disturbance but a mild toxic state, with moderate leukocytosis and a low-grade fever. The patient might be considered symptomless by the uncritical diagnostician and yet at necropsy extensive amebic ulceration of the colon might be demonstrated. Throughout this period both by direct and indirect methods there developed increasing evidence that *Endamoeba histolytica* is always actually or potentially a pathogen and that it is capable of invading and destroying host's tissue without the aid of pathogenic bacteria.

* Alvarenga Prize Lecture IV (Award XXXVIII), The College of Physicians of Philadelphia, October 13, 1943.

HOSTS OF ENDAMOEBA HISTOLYTICA

In addition to man the following hosts have been described as infected in Nature or susceptible of experimental infection with *Endamoeba histolytica*: dogs, cats, monkeys, rats, pigs, guinea-pigs and rabbits.

Darling (1915), Ware (1916), Fischer (1918), Bauche and Motais (1920), Faust (1930, 1931) and Boyd (1931) have described spontaneous amebiasis in dogs either in isolated instances or in epidemics among small groups of dogs. Lösch (1875), Hlava (1887), Harris (1901), Dale and Dobell (1917), Faust (1930–1934), Andrews (1932), Swartzwelder (1939) and Tobie (1940) have demonstrated the infectibility of dogs with trophozoites or cysts of human strains of *E. histolytica*. On the basis of previously published data and extensive personal observations Faust (1932) concluded that dogs usually obtain their infection from man but do not constitute a normal source of exposure for human beings. The lesions in the dog may be few and superficial or extensive and deep-seated. The symptoms may be acute or chronic, or spontaneous recovery may result after a short period of colonization by the amebae in the bowel wall. Occasionally liver abscess may develop following invasion of the intestine.

Many workers have infected kittens with human strains of *E. histolytica*. Among the more important investigators have been Marchoux (1899), Craig (1905), Wenyon (1912), Baetjer and Sellards (1914), Dale and Dobell (1917), Kessel (1928), Rees (1929), Meleney and Frye (1933, 1937) and Deschiens (1938). Kittens develop a fulminating, frequently fatal amebic dysentery and are therefore excellent for acute experiments. There appear to be no records of their infection in Nature.

Many species of Old and New World monkeys are naturally infected with strains of *Endamoeba histolytica* indistinguishable from those occurring in man. The incidence of natural infection in these animals is usually high, while experimentally induced infection with simian or human strains is easily accomplished. Although amebic invasion of the monkey's large bowel has been demonstrated (Johnson, 1941), the parasite usually lives in relative equilibrium with its simian host so that acute symptoms seldom develop.

Pigs, guinea-pigs, rabbits and rats are probably incidental hosts of *Endamoeba histolytica* and in Nature apparently play no important rôle as reservoirs of the infection.

SOURCES AND METHODS OF EXPOSURE TO INFECTION

On the basis of information concerning amebic infection in hosts other than man it must be concluded that man is primarily, in fact almost exclusively responsible for his own infection. Although it has been demonstrated experimentally (Lösch, 1875; Swartzwelder, 1937) that infection in dogs can be accomplished by feeding the trophozoites in a bloody-mucous menstruum, it is hardly conceivable that this stage serves as a source of human infection. On the other hand, there is a wealth of records of infection in susceptible experimental animals, which, with the critical experiments of Walker and Sellards (1913) on human volunteers, demonstrates that cysts constitute a ready source of infection, and that the method of their entry into the body is by the oral route.

In what way or ways do cysts of *Endamoeba histolytica*, discharged from the bowels of infected individuals, reach the human mouth? The most common hypotheses predicate water, food, flies and contact contamination. While each of these hypotheses fits well into the epidemiology of amebiasis, there is a paucity of direct proof for any one of them.

The *water hypothesis* is supported by circumstantial evidence, and hence indirect proof, in the case of the hyperendemicity of amebic dysentery in Manila and the Panama Canal Zone in the early days of American occupation, together with a marked diminution in the incidence and the intensity of the disease soon after the installation of sanitary water and sewerage systems in these localities. Moreover, the report of specialists in the 1933 Chicago hotel outbreak of amebic dysentery (Bundesen et al., 1936) concluded that drinking water contaminated by cross-connections with sewage pipes was responsible for the epidemic. One member of the investigating committee, the late Dr. F. W. O'Connor, lived in the hotel for one month, drank water from the faucet in his room and acquired amebic dysentery with amebic liver abscess. Although these are very important epidemiologic data, the fact remains that in none of these instances were cysts of *Endamoeba histolytica* reported to have been actually isolated from the contaminated water. Again, it is also plausible, but not confirmed, that shallow wells in rural areas may serve as a source of infection for the amebiasis which is widely disseminated throughout the Southeastern United States.

The *food hypothesis* is accepted by many epi-

demiologists as the most satisfactory explanation for the extensive distribution of amebiasis. In Oriental countries where truck crops and small fruits are fertilized with human nightsoil, it is conceivable that infection may be acquired from eating raw lettuce, celery, radishes, and strawberries, provided fermentation of the nightsoil or desiccation of the cysts does not kill the cysts. A more likely contamination of food is that due to food handlers. Milam and Meleney (1931) found a correlation between *E. histolytica*-infected mothers in rural Tennessee and familial amebiasis. Schoenleber (1941) found that anti-amebic treatment of *E. histolytica*-positive food handlers on the island of Aruba, off the coast of Venezuela, reduced both the incidence rate of amebiasis and the amebic colitis rate 92 per cent in three years. Surveys on food handlers in Chicago (Hood, 1943), in San Francisco (Johnstone and Iverson, 1935) and in Philadelphia (Wenrich, Stabler and Arnett, 1935) has demonstrated a higher incidence of amebiasis in this group than in the population at large, but Sapero and Johnson (1939) found no evidence in navy personnel that food handlers constitute any particular hazard in the dissemination of the infection.

The *fly hypothesis* has not been given as great emphasis as the two views previously considered. In city populations essentially free of the dangers of filth flies this hypothesis obviously is not tenable, but in rural areas and throughout the Tropics and the Orient there is circumstantial evidence that flies may play the essential rôle in the rapid dissemination of the disease. Craig (1917) attributed an epidemic of amebic dysentery in an Army post at El Paso, Texas to flies. The writer made a similar observation in a foreign hill station in China during the summer of 1921. Moreover, amebiasis is particularly prevalent in fly-infested regions from Morocco to Peking. Thomson and Thomson (1916), Wenyon and O'Connor (1917), Roubaud (1918), Root (1921) and Pipkin (1942) have demonstrated viable cysts of *E. histolytica* in both the gut and dejecta of flies after experimental feedings, while Frye and Meleney (1931) found that flies caught in 4 of 12 dwellings which housed human cyst passers contained viable cysts of *E. histolytica.*

The *direct contact hypothesis* is probably applicable to a wide range of unsanitary situations in warm moist climates but in cooler climates may also apply, particularly to institutional groups, as children's asylums, mental hospitals and prisons. Outbreaks of amebic dysentery in prisons are much more frequent than the medical literature indicates. Mental hospitals have been found to be particularly afflicted with amebiasis from Panama (Darling, 1911) to Sweden (Svensson, 1928), and the infection has been found in children's homes from New Orleans to Saskatoon (Miller, 1939). In New Orleans several children's homes and one infant asylum have been studied by the Department of Tropical Medicine of Tulane University since 1929. In all of these institutions the incidence was found to be high, beginning with children slightly over one year of age and increasing rapidly to the period of adolescence (Faust, 1933). Epidemiologic studies carried out at the infant asylum (Ivanhoe, 1943) have demonstrated that identifiable cysts of *Endamoeba histolytica* were recoverable from the bottom of the laundry chute, from underpanties washed in tepid water, from play objects, floors and from the bottom of the children's wading pool. Although the place was apparently clean and the water supply uncontaminated, a careful study of the habits of the children showed that direct contact contamination was prevalent. In certain mental hospitals and prisons the opportunities for gross transfer of amebic cysts from one individual to another are much greater than in the average children's home.

An examination of the evidence concerning the methods of exposure to amebiasis leaves much to be demonstrated. Without being hypercritical the student of scientific medicine will reserve judgment until more direct proof has been presented as to how in each situation amebiasis is actually perpetuated.

PATHOGENESIS

The stage of *Endamoeba histolytica* most likely to produce infection in man is the freshly ripened 4-nucleate cyst, which is present in formed stools of infected individuals within a few hours after the stools have been passed. If these cysts gain entry to the mouth and are swallowed, they pass unmodified through the stomach into the small bowel. On arrival in a neutral or slightly alkaline medium of the latter the 4-nucleate organism within the cyst wall becomes activated while the wall itself becomes weakened. This characteristically results in the ameba effecting an escape through a little rent in the wall. Thereupon a small amount of cytoplasm becomes associated with each of the

four nuclei (or at times a supernumerary division of the nuclei may occur), with the result that four (or eight) minute metacystic trophozoites are formed. These trophozoites now pass down the remaining portion of the ileum, through the ileo-cecal valve, and into the large bowel.

Stasis of material *en transit* through the intestine normally first occurs at the level of the cecum. If the metacystic trophozoites come in contact with the cuticula of the intestinal epithelium at this level for only a short time (probably measurable in minutes), they are enabled to establish a little "foothold," which constitutes their *entrê* to tissue invasion. At times they may be swept past the cecum into the colon or rectum, where they may become attached, or perchance they may be passed out the anus in feces without having had an opportunity to make tissue contact.

The exact method by which the trophozoites establish themselves in the mucosa of the large bowel has been studied experimentally in dogs (Faust and Kagy, 1934), kittens (Rees, 1929, Hiyeda, 1930) and monkeys (Hegner, Johnson and Stabler, 1932), and is paralleled in human amebiasis (James, 1928). (See figure 1.) By lysis a very small cavity is produced in the superficial portion of a principal or gland cell. This may occur with equal likelihood at the tip of an interglandular prominence, part way down the crypt or at the base of the crypt. By continued lytic action, aided at times by mechanical activity of the pseudopodia, the ameba continues its invasion into the cell, utilizing the digested cell substance as food. Following growth it multiplies by binary fission and thus a small colony becomes established. If these various factors are optimal, the colony may be formed within 24 hours or less after initial contact with the surface of the mucosa.

Once entry into the intestinal epithelium has been effected and the colony has started, the direction of tissue penetration and destruction is towards and through the muscularis mucosae. If lodgment was originally secured part way down a crypt, destruction of the superficial portion of the cells continues to the base. If the colony first became established at the base of the crypt, erosion of cells in this area occurs. In neither case do the amebae immediately come in contact with intestinal blood capillaries and thus rather extensive destruction may occur in a limited area without hemorrhage. If, on the other hand, the original site of colonization was at the tip of an interglandular prominence, the amebae come in contact with blood capillaries as soon as they penetrate into the tunica propria below the epithelium, so that early hemorrhage results. In the average case the lesion progresses unhindered as a more or less capillary column until it reaches the muscularis mucosae where somewhat more resistant tissue is encountered. This causes a temporary pyramiding of the amebae, but soon some of them break through into the submucosa. There is now a tendency for the amebae to progress radially in this less resistant tissue, frequently gaining entrance into lymphatic capillaries and at times invading mesenteric venules. The usual result is the enlargement of the lesion basally in the submucosa, so that in section it is similar to a bottle with a narrow neck and expanded base. This is the typical uncomplicated amebic lesion.

At times in man, the monkey and the dog the lesion may be confined to the mucosa, in which case tissue destruction may be very superficial and spontaneous evacuation of the colony may occur with healing by growth of simple columnar epithelium (Tobie, 1942). Or repair may keep up with tissue destruction and only shallow microscopic depressions or craters will result (Faust, 1941). In kittens much more intensive destruction usually occurs.

These uncomplicated amebic lesions are essentially different from those produced by *Shigella*

FIG. 1. Semi-diagrammatic section of the wall of the cecum, showing successively from upper to lower strata: (1) lumen of the bowel; (2) mucosa, with glandular crypts and interglandular projections; (3) muscularis mucosae; (4) subcutaneous tissue; (5) circular muscle layer; (6) longitudinal muscle layer; (7) serosa, and (8) peritoneal cavity. The blood capillaries are shown in the tunica propria of the mucosa and their continuations, with anastomoses, into the mesenteric venules in the deeper layers of the wall.

From left to right there are free in the lumen of the cecum (a) numerous metacystic amebae which have entered through the ileo-cecal valve. (b) The individuals coming in contact with the mucosa, on the tip of an interglandular prominence, part way down a crypt or at the base of a crypt, are in a position to initiate tissue invasion, and to develop colonies which (c) may penetrate into the deeper layers of the wall, (d) may enter mesenteric venules and be carried to the liver, (e) may coalesce to produce undermining lesions, and will (f) provide trophozoite progeny which escape from the primary lesions and are enabled to initiate secondary ones farther down the bowel.

FIG. 1

dysenteriae. In primary amebiasis the sites of entry into the bowel wall are typically pinpoint and separated from one another, with a raised annulus surrounding each opening. There is little, if any, hyperemia or inflammation and microscopically there is no infiltration of neutrophiles. In bacillary colitis the surface of the bowel is hyperemic and inflamed and the lesions are confluent, while microscopically there is extensive invasion of neutrophiles. The amebic lesion is typically columnar in the mucosa but is continued into a bulbar base in the submucosa. The lesion of *Shigella* colitis seldom extends below the superficial half of the mucosa.

Once the characteristic bottle type of amebic lesion has been developed it may by extension reach the muscular coats of the bowel and even perforate through the serosa. Amebae which have secured entry into mesenteric venules in the submucosa and muscularis may be carried to the liver, where they may set up multiple small colonies (amebic hepatitis) or one or more large cavernous abscesses. Again, extensive colonization in the submucosa may result in undermining tunnels, with the junction of adjacent colonies and complete loss of arteriolar blood supply for the overlying tissues. Amebae (trophozoites) extruded from primary lesions in the upper levels of the large bowel may by regurgitation be carried back to the posterior segment of the ileum or become lodged on the ileo-cecal valve where secondary lesions may develop. Or, perhaps more often, the organisms will pass down the bowel, come in contact with the mucosa at lower levels and there initiate secondary colonies.

In the average host parasitized by *Endamoeba histolytica* the majority of primary lesions occur in the cecal area, including the cecum, appendix, the distal segment of the ileum and the ascending colon. The other focus of high frequency is the rectal area, including the sigmoid colon and the rectum. Even after numerous secondary lesions have been developed the cecal area still contains a preponderance of the total number of lesions (Faust, 1941). Except in fulminating acute amebiasis or infections of long-standing the middle segment of the large bowel is only incidentally involved. (See fig. 2.)

Although it has been demonstrated that bacteria are not necessary for successful entry of *Endamoeba histolytica* into the bowel wall (Faust and Swartzwelder, 1935; Frye and Meleney, 1933) the older amebic ulcers are frequently complicated by bacterial invasion. Moreover, amebic colitis may be superimposed on a pre-existing *Shigella* colitis or *vice versa.*

It will next be useful to inquire into the chances of infection and of tissue invasion by *Endamoeba histolytica.* Infection is contingent on a number of factors which vary considerably under different conditions. First of all is the question of exposure. Qualitatively there must be viable organisms which have an opportunity of gaining entrance to the mouth and of being swallowed. On reaching the small bowel cysts must be capable of excysting.

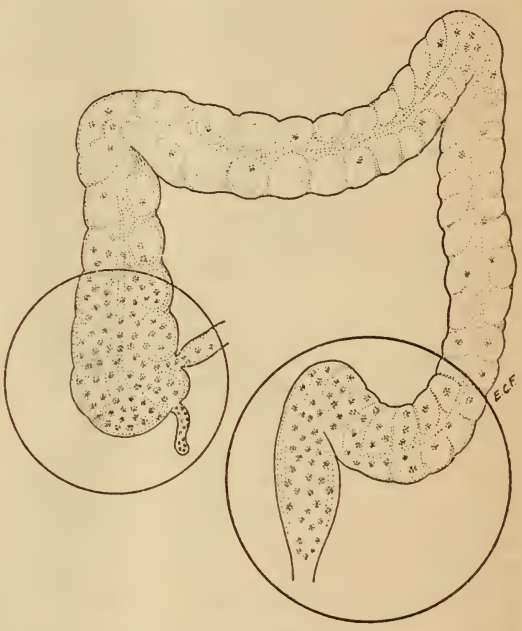

FIG. 2. Diagram of the large bowel indicating the preponderance of amebic lesions in the cecal area (cecum, appendix, distal segment of the ileum and proximal segment of the ascending colon) and in the rectal area (rectum and sigmoid colon).

If the medium is too acid or the intestinal juices are too weak or are diluted too much by food in the process of digestion, it is altogether likely that excystation will not occur and thus the cysts will pass through the large bowel and be evacuated without providing an opportunity for an infection to become established. Even though excystation occurs, if the number of metacytic trophozoites is scant the chances of their coming in contact with the cuticular surface of the epithelium of the large bowel are very remote, particularly if they are in the midst of a considerable menstruum of partly digested food or feces. Moreover, hypertonicity

of the bowel is likely to carry the organisms through the bowel too rapidly for them to make temporary contact with the mucosal surface. Probably human beings in mildly endemic areas are often exposed to a few viable cysts which actually excyst in the ileum but never have an opportunity to colonize in the bowel. On the other hand, in areas of hyperendemicity repeated exposure to large numbers of viable cysts provides the appropriate setting for development of heavy infections in a large group of the population.

The virulence of the particular strain of ameba also undoubtedly has considerable influence on initial colonization and continued tissue invasion. There is specific evidence based on experiments with human strains of *Endamoeba histolytica* in cats and dogs (Meleney and Frye, 1933; Frye and Meleney, 1939; Faust and Swartzwelder, 1935) that different strains vary in their pathogenicity, but specific evidence is lacking in support of the view, predicated by Brumpt (1928) and other European workers, that certain human strains of *E. histolytica* are non-pathogenic. An additional fact concerning this organism is significant, namely that its virulence can be considerably enhanced by rapid passage through susceptible hosts (Faust and Swartzwelder, 1935; Meleney and Frye 1937). This last property of the ameba may explain the rapidity with which an epidemic of amebic dysentery develops once heavy initial infection has been provided.

The factors thus far considered concerning opportunities for infection have been extrinsic in character and have not dealt with host susceptibility. Certain animals are undoubtedly completely resistant to infection with *Endamoeba histolytica*. In others, as the rat, there is suggestive evidence that colonization may possibly take place without the necessity of tissue invasion. On the other hand, in man, the monkey, the dog and the cat the evidence preponderates in favor of the view that infection can not be maintained for any length of time without tissue invasion. The kitten is a delicate test animal in amebiasis because it is highly susceptible to infection, the lesions develop rapidly and the infection is frequently fatal in a relatively short time. Monkeys are also readily infected with both human and simian strains of *Endamoeba histolytica*, but dysentery seldom results and typically only cysts are discharged in a semi-formed stool. In many respects the dog constitutes a particularly good laboratory animal for the study of amebiasis. If young dogs are properly conditioned for infection, at least ninety per cent tissue invasion may be secured (Faust and Kagy, 1934; Tobie, 1940). In dogs the period of incubation can be shortened and the intensity of the infection can be increased by rapid passage of the organism from dog to dog (Faust and Swartzwelder, 1935).

Thus, in the dog acute dysentery can be produced comparable to that in the cat or to fulminating amebic dysentery in man. On the other hand, by appropriate technics the infection in the dog can frequently be transformed into a chronic state or at times terminated, even without the administration of specific anti-amebic drugs. Amebiasis in man varies both qualitatively and quantitatively. At times it resembles infection in the kitten; more frequently it simulates the infection in the dog; in the majority of cases, however, it is less severe and is comparable to simian infection.

Probably the most important single intrinsic factor which determines whether amebiasis in the susceptible animal is acute, chronic or relatively asymptomatic is the degree of host resistance based on the nutritional level. In general, carbohydrates provide an opportunity for *Endamoeba histolytica* to multiply and animal proteins reduce this capacity (Hegner and Eskridge, 1935, 1937; Lincicome, 1942), but the problem is not so easily solved. In conditioning dogs for experimental infection with human strains of *E. histolytica* the writer found (Faust, 1930) that salmon and unfortified white bread provided a suitable low resistance diet for inducing and maintaining amebic infection, but that salmon alone was equally effective. Since these animals developed an anemia, it was important to discover if the cause was lack of the anti-anemic factor. Ventriculin exacerbated the condition but fresh raw liver controlled it. Whole raw liver or freshly expressed juice of raw liver produced best results, providing amebostatic and at times amebicidal action (Faust and Kagy, 1934a). Moreover, fresh liver was much more effective than desiccated liver, while commercial liver extract or freshly extracted liver juice passed through a Seitz filter, when introduced parenterally, was ineffectual in controlling acute amebiasis, although both preparations stimulated erythropoiesis (Faust and Swartzwelder, 1936). The most interesting finding in this series of experiments developed when finely ground-up fresh liver or fresh liver juice was employed as a high retention enema in dogs suffering from acute amebic colitis. The disease was as

effectively controlled as when the fresh liver was fed to the animals (Faust and Kagy, 1934a).

Vitamins conceivably have a very important rôle in the control of amebiasis, but in so far as the writer knows this problem has not been subjected to critical experimental or clinical study.

An additional point in the evaluation of amebiasis in man concerns racial or group tolerance to the infection. There is no clear evidence indicating that race or sex is in itself important but there are good epidemiologic data indicating that long exposure of a particular population group to strains of *Endamoeba histolytica* tends to establish a host-parasite equilibrium for the homologous strains of the parasite. In such groups of human beings, even with constant exposure due to primitive sanitary conditions and a correspondingly high rate of infection with a heavy "load" of parasites, clinical manifestations are uncommon (Faust, 1931; Meleney and Frye, 1933; Ivanhoe, 1943). Nevertheless, individuals from outside the hyperendemic areas who are exposed to the same strains of *Endamoeba histolytica*, not uncommonly develop a fulminating amebic colitis. It appears, therefore, that long-time constant exposure to amebiasis tends to produce considerable tolerance to the amebae, with consequent reduction in invasion and in destruction of tissue.

PATHOLOGY AND SYMPTOMOLOGY

It is not the purpose of this paper to provide a clinical description of amebiasis but rather to analyze some of the fundamental evidence on host-parasite inter-relationship in amebiasis which may assist the clinician in visualizing his problems. A clear picture of the levels at which the amebic lesions occur, their numbers and the depths of penetration of the amebae constitutes the essential fundamental background for a clinical appreciation of the disease.

Perhaps the most commonly overlooked syndrome which should suggest the possibility of amebiasis, especially in tropical countries, is that of appendicitis. Amebic lesions in the cecum, appendix, or adjacent levels of the ileum or ascending colon may give rise to dull throbbing or intense knife-like pain in the lower right quadrant of the abdomen or by reference the pain may suggest gall bladder disease or peptic ulcer. Patients having infection at this focus may consistently pass stools which are formed, or constipation may alternate with diarrhea. In New Orleans ten per cent of appendicitis cases in the surgical service of Dr. Alton Ochsner in Charity Hospital were found to have amebic involvement. In the Santo Tomás Hospital in Panamá the frequency has been one-third of appendicitis cases coming to operation. Early recognition by the clinician of the frequency of amebiasis of the cecal area usually allows management of the case by the internist and prevents unnecessary surgical intervention, since anti-amebic therapy in these cases will probably eventually be required.

Asyndromic amebiasis may cause general colonic disturbance, nervous symptoms or fatigue. In such patients one or more well established amebic ulcers have usually developed, most commonly in the cecal area.

In chronic amebiasis the amebic lesion is usually secondarily infected with bacteria, which provoke an infiltration of neutrophilic leukocytes. Moreover, in this type of amebiasis a moderate leukocytosis is frequently observed in the circulating blood, so that the blood picture disguises the diagnosis of amebiasis.

Amebic invasion of the liver is probably much more common than the records of acute hepatic amebiasis indicate. Amebae which enter the mesenteric venules in the submucous coat of the large bowel are swiftly carried to the liver, to be filtered out in the portal capillaries. In the great majority of cases the amebae do not colonize in the liver parenchyma but soon die. The cause of this amebostatic action is unknown, but it is plausible that the same unknown substance in liver extract which has been found experimentally to control the infection in the bowel operates even to a greater degree in the liver itself. If the suggestion may be carried one step farther, it is possible that a quantitative reduction in the production of this as yet unknown fraction of liver extract allows the amebae to multiply, with resultant amebic hepatitis or liver abscess.

DIAGNOSIS

While an internist who has had years of experience in the study of dysenteries can frequently make an accurate diagnosis of fulminating amebic or bacillary dysentery on the macroscopic appearance of the freshly passed stool, this method does not provide a safe basis for diagnosing amebiasis in its broader aspects. In practice it is necessary to recover *Endamoeba histolytica* itself either in its trophozoite or cystic stage, and to differentiate it from other protozoa of the digestive tract as well as from macrophages and *Blastocystis*.

Visualization of the organism can be accomplished from microscopic films prepared from formed, semi-formed or liquid stools, from purgative or enema specimens, from proctoscopic material or after *in vitro* culture of the ameba. None of these is 100 per cent efficient.

In the laboratories of the Department of Tropical Medicine of Tulane University the following routine method of examination for *Endamoeba histolytica* has been in operation for several years. First of all microscopic films of the freshly passed stool are prepared. These consist of (1) a direct film, one side unstained, one side stained with D'Antoni's iodine; (2) a supplementary hematoxylin-stained direct film; (3) a film resulting from concentration of cysts by the zinc sulphate centrifugal floatation technic. Three stools, passed on alternate days or preferably every third day, are examined in this way. Both by practical tests and by calculation it has been found that 85 to 90 per cent of positive cases are diagnosed by these combined technics on the three stool samples, whereas a single direct fecal film accounts for only 20 to 25 per cent of *E. histolytica*-positives. In individual cases with a history of chronic colitis proctoscopic examination, purgation with Glauber salts or phospho-soda, or high physiologic salt enemas are carried out.

While cultures of the specimen on *E. histolytica* culture media are satisfactory for the demonstration of the organism recovered from liquid or semi-liquid stools, cysts of this organism at times fail to excyst in the culture medium, thus providing false evidence of a negative.

In areas or population groups of high endemicity, in which there is not only a high incidence of infection in the population but also a large number of amebae per individual, evidence of infection is readily obtained from stool examination. In areas of low endemicity, in which the incidence is low and the average number of amebae per individual is small, the problem of diagnosis is difficult or at least tedious. In the United States very high incidence occurs in certain population groups, as in rural areas of the Southern Appalachians and in children's asylums in New Orleans. In other areas, particularly in the north, the incidence may be as low as one per cent, although in most regions it varies between five and ten per cent. The ease or difficulty experienced in the diagnosis of *Endamoeba histolytica* in any particular locality will depend not only on the skill of the diagnostician and the methods which he utilizes but also on the wealth or dearth of the amebae in the patient's feces.

TREATMENT

It would be unsuitable for the writer to deliver a set of dicta on anti-amebic treatment for the practicing physician, but there are certain basic observations which are relevant and proper.

Twenty-five years ago *ipecac* was commonly utilized in the treatment of acute or chronic amebic colitis. It frequently cured the patient who could retain enough of the drug to act on the amebae. Meanwhile *emetine hydrochloride* had been demonstrated to be very effective in bringing the infection under control and particularly in alleviating symptoms. *Stovarsol* (acetarsone), originally prepared by Ehrlich, was first utilized by the French for the treatment of syphilis and African sleeping sickness, but by 1920 it was found to be effective in the control of amebiasis. Because of the high percentage of patients taking the drug who developed severe intestinal colic as well as other types of arsenic intolerance, this product has been practically replaced in recent years by less toxic anti-amebic drugs. *Carbarsone*, another arsonic acid compound originally prepared by Ehrlich, was introduced by Anderson and Reed in 1931 as a highly specific drug for the treatment of amebiasis and was described as much better tolerated than stovarsol. Meanwhile, in 1921, Mühlens and Menk advocated the use of *chiniofon*, an iodo compound which they introduced under the trade name "Yatren." This drug was soon given extensive clinical trial and found to be a very efficient and well tolerated anti-amebic drug. In 1936 *diodoquin*, another iodo compound, was released by Searle for clinical trial in the treatment of amebiasis. Its use is gradually being extended as its anti-amebic value and high tolerance are being demonstrated. *Vioform*, a third iodo compound, has been recommended for the treatment of amebiasis but has never been widely used.

Today the drugs most commonly prescribed for amebiasis in the United States are emetine hydrochloride, carbarsone, chiniofon and diodoquin. Emetine hydrochloride is the only known eminently satisfactory preparation for the treatment of amebic hepatitis and amebic liver abscess. For amebiasis of the intestinal tract its usefulness consists primarily in controlling acute symptoms, but within limits of safe administration it can not be guaranteed to terminate the infection. For routine treatment of amebic colitis, whether acute,

chronic or "carrier type," carbarsone, chiniofon and diodoquin constitute the present-day drugs of choice. For patients with arsenic intolerance one of the iodo preparations should be utilized. Moreover, in experimental amebiasis in the dog the writer and a junior colleague (Faust and Tobie) have recently demonstrated that carbarsone has only a 75 per cent amebicidal efficiency compared with chiniofon. For a short course of treatment chiniofon is most likely to eliminate the infection but in some persons it provokes a severe watery diarrhea. Diodoquin apparently has no contraindications but requires a longer period of treatment because of its slower absorption rate into the bowel wall.

An analysis of the present status of chemotherapy in amebiasis indicates that marked progress has been made in the past quarter century in the development of a few relatively specific drugs which are rather well tolerated by the patient. Yet in amebic colitis no one of these drugs and occasionally no combination of them provides a guaranteed cure. There is abundant need and opportunity to explore other preparations, including refined products of crude drugs utilized by Oriental and Amerind peoples, as well as new synthetics.

Finally, a suggestion may appropriately be made concerning the nutritional state of the patient in amebiasis. Experimental evidence suggests that during the period of treatment the carbohydrate intake should be reduced and that nutritious, readily digestible animal proteins should be increased. The possible rôle of vitamins in raising the threshold of resistance to the pathogen has never been given experimental or clinical trial, either in preventing infection or in controlling tissue invasion. This suggests the need for serious intensive study.

CONTROL

Justification of preventive measures in any particular disease is based on two premises: (1) that the disease is clinically important, and (2) that it is a public health hazard. In an infection like amebiasis it is easier to dodge the issue than to meet it squarely and to provide machinery for practical control. Yet an honest evaluation of the evidence in amebiasis definitely indicates its actual or potential danger to individuals and communities which harbor the etiologic agent.

The problem of control is somewhat simplified by remembering that reservoir hosts play no important part in the propagation of amebiasis, so that man may thank himself for the infection. Moreover, the individual who is least likely to manifest symptoms, namely the so-called "carrier case" who is passing cysts in his stools, is the primary offender. Exposure occurs through entry of viable infection-stage cysts of *Endamoeba histolytica* as a contamination into the mouth. Infection may occur from a single massive dose of cysts, or from repeated lighter doses taken into the mouth in food or water. While the epidemiologic evidence is not conclusive, it is apparent that safeguarding of food and drink from contamination should do much to protect the population. The public must be made aware that dirty food handlers should not be tolerated. By sanitary regulations these individuals should be examined for amebic infection and, if found positive, should be treated until they are negative. Filth flies should not be allowed to breed; they are not only a menace in this infection but in practically all other diseases primarily involving the gastrointestinal tract. Thorough sanitary campaigns should be carried out in eleemosynary institutions to clean out these hotbeds of infection. An awakening of the public consciousness regarding the potential dangers of amebiasis constitutes an additional essential part of the control program. Meanwhile the practicing physician, by his respectful attitude towards amebiasis in his own patients, whether they manifest symptoms or are apparently symptomless, can do much to further this end.

CONCLUSIONS

The material which has been presented in this paper is not intended for immediate practical application by the clinician but as a basis for reorientation and re-evaluation of the problem of amebiasis. Some of the remarks are personal reflections of the writer which have never previously been expressed except in informal conferences. It is believed, however, that the subject justifies this type of presentation. It is the writer's sincere hope that some little stimulus will have been provided which will aid the physician and the epidemiologist in elucidating the several obscure aspects of the problem of amebiasis, so that in the future practical means may be found for its control.

It has been a very real honor to be the 1943 recipient of the Alvarenga Prize of the College of Physicians of Philadelphia and a privilege to address this distinguished body.

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The Dynamics of Shock and Its Clinical Implications*

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CONFUSION

THE enigma of shock has baffled physicians for a century and has been studied intensively by all ranks of investigators. These have included both novices and scientists of experience, those bent on vindicating some favored theory and those seeking only valid evidence. Some did not provide adequate controls on major factors of the experiment; others drew conclusions contradictory to their own data. Is it strange, then, that confusion rather than clarification resulted? None of the early theories survived the test of controlled experimentation; yet the net result was an accumulation of factual evidence. The accurate correlation of this evidence became the task of subsequent workers.

The first World War stimulated research which provided significant information. Under the auspices of the British Medical Research Committee, experienced workers made an intensive study of shock resulting from wounds. Surgical experiences, combined with experimental studies, supported the explanation known as *traumatic toxemia*. It is summarized as follows (8):

"The theory of secondary shock which has the strongest support, both in clinical observations and in laboratory experiments, is that of a toxic factor, arising from damaged and dying tissue and operating to cause an increased permeability of the capillary walls and a consequent reduction of blood volume by escape of plasma into the lymph spaces. Thus the concentration of the corpuscles is also readily explained. It is recognized that, after a sufficient time, infection may occur and be of such character in itself as to induce a persistent low blood pressure. According to this theory there may be no essential difference between the effects of toxins given off by damaged tissue and of toxins resulting from activity of bacteria."

This interpretation was widely accepted for it integrated smoothly both with the experiences of surgeons and with what was known of capillary reactions at that time. Then a new theory was proposed which attributed shock entirely to hemorrhage and to loss of fluid in the injured areas. All the accompanying phenomena were explained, to the author's satisfaction, without admitting the effects of toxic substances absorbed from damaged and infected tissues. This theory was so widely publicized that many accepted it as the final solution of the problem. Attention has been directed repeatedly (9a,b,e) to sources of error inherent in the methods used in support of this theory, and to lack of adequate controls on important experimental factors.

SHOCK VS. THE EFFECTS OF HEMORRHAGES

Superficial similarities between shock and the effects of hemorrhages have led to the assumption that the two are identical. Many have based conclusions regarding shock, upon the results of simple bleeding, and some even advocate hemorrhage as the method of choice for producing shock experimentally. It appears that no one had made a comparison of the physiologic disturbances resulting from these two conditions. My associates and I undertook such a comparison. We collected the recorded observations of different workers on various features seen in shock and after hemorrhages respectively; then we verified each item experimentally (9c). The results of these comparisons follow:

Features Identical in Shock and Hemorrhage

Sympatho-adrenal activity
- Stimulation of myocardium
  - Strong rapid pulse in early stages
- Peripheral vaso-constriction
  - Reduced volume flow
  - Peripheral ischemia, pallor
  - Loss of tissue turgor

* Thomas Dent Mütter Lecture LVI, The College of Physicians of Philadelphia, December 1, 1943.

Discharge of reservoir blood into systemic circulation
Contraction of spleen
Increased blood sugar
Dilatation of pupils, often perspiration
Low basal metabolism
Declining temperature
Decreased alkaline reserve
Decreased serum protein
Increased respiratory rate, thirst
Low arterial blood pressure (in late stages)
Death due to inadequate circulatory function

Because of these similarities, shock and the effects of hemorrhages have been regarded as identical. Other features which have been reported in shock from wounds, burns, intestinal obstruction, anaphylaxis and other causes, are tabulated below and compared with the same items after simple hemorrhages.

repeated small hemorrhages with death in 1 to 4 days. In every instance, the findings recorded under *Hemorrhages* resulted; in no case did the changes characteristic of shock develop.

It seems remarkable that such numerous and important differences escaped the attention of those who have written voluminously on hemorrhages as the cause for shock. More remarkably, a few even advocate hemorrhages as the method of choice for producing shock experimentally. Let it be emphasized that hemorrhages, when present, are a highly important contributory factor; an animal or person in shock may not survive a minor hemorrhage which under normal conditions would have insignificant effects. But hemorrhages alone, independent of trauma, anesthesia or of toxic effects, will *not* produce the syndrome of shock.

CONTRASTED FEATURES

Items	*Shock*	*Hemorrhage*
Endothelium	Permeable to colloids	Impermeable
Flow of lymph	Increased	Decreased
Tissue fluid	Increased	Decreased
Fluid balance	Disturbed	Undisturbed
Absorption	Impaired	Unimpaired
Vomiting	Persistent	No vomiting
Diarrhea	Frequent	Absent
Saline solutions, intravenous	Ineffective	Often effective
Renal:		
Excretion	Deficient	Unimpaired
Urine	Concentrated, low volume, albumin, erythrocytes, bile, debris	No characteristic changes
Blood:		
Coagulation time	Lengthened	Shortened
Concentration	Increased	Decreased
Non-protein nitrogen	Increased	Decreased
Potassium	Increased	Terminal increase
Plasma chlorides	Decreased	Increased
Necropsy findings:		
Edema of soft tissues	Characteristic	None
Serous effusions	Present	Absent
Capillo-venous congestion	Characteristic	Absent
Petechiae	Characteristic	Absent
Visceral ischemia	Absent	Present
Organ weight	Increased	Decreased
Gastro-intestinal tract	Dilated, atonic	Contracted
Parenchymal necroses	Present	Absent

We have attempted to produce the features recorded under *Shock*, by hemorrhages of all degrees and varying duration: by successions of large hemorrhages ending fatally in 4 to 8 hours, and by

REALISM

The sole objection to the explanation of traumatic toxemia was negative in character, based on the fact that no toxic substances had been isolated

and identified chemically in the blood during shock. Presumably the toxic substances which result from trauma are cleavage products of tissue autolysis or of bacterial action upon tissue proteins. Chemical methods are not yet perfected to identify such substances in the blood, except as non-protein nitrogen. The latter is markedly increased during shock and is attributed (Whipple and others) to destruction of the body's proteins. The objection mentioned took no account of these facts nor of the mass of clinical and pharmacologic evidence indicating toxic effects.

Recent contributions on shock have been savored with the salt of objective realism. Best and Solandt (1) instituted exchange transfusion of blood between pairs of dogs in one of which, shock was induced by trauma. The untraumatized dogs developed shock as did those traumatized. These results were interpreted as indicating the effects of a toxic substance released from injured tissues and conveyed by the blood. Kendrick, Essex, and Helmholz (5) performed a somewhat similar experiment by exchange transfusion which likewise furnished evidence supporting the theory of toxemia. Even those who have opposed vigorously the conception of a toxic factor, have now relaxed their opposition. For example, Freeman and his collaborators (3) reported experiments on traumatic shock which they interpreted as indicating the effects of a toxic factor absorbed from the traumatized region.

A coördinated attack on the problems of shock was organized by the National Research Council in 1940. Two years later the workers met to compare results and to outline further studies. The evidence on toxic factors led to the conclusion that the importance of these must now be recognized, and it was recommended that investigations be directed toward determining the sources and the nature of these toxic substances. This report was accepted without dissent. Thus we have witnessed a complete cycle of medical thought; we find a well-informed group of research workers endorsing the interpretations of 25 years ago.

This view is in agreement with an enormous mass of clinical and experimental data, and it is supported by necropsy findings. A distinctive pattern of pathologic changes is seen in the viscera after death by shock. This consists of capillary atony, hyperemia, stasis, edema, and ecchymoses in the lungs, mucosae, serous surfaces and in the liver and kidneys. These changes indicate with certainty the nature of the circulatory disturbances and confirm the interpretation of toxic action. The recognition of a toxemic factor abolishes the most important subject of dissension. It appears that investigations on other features of shock can now go forward in an atmosphere somewhat cleared of controversial discussions.

AGREEMENT

Space does not permit an analysis of other proposed theories and of the factual evidence which rendered each of them unsupportable. Those interested are referred to recent publications in which these have been examined critically (9a,b,e).

The basic principles, on which there is apparent agreement, are as follows. Surgical shock is due not to one cause but to a combination of causes: the anesthetic, the local loss of blood and fluid, emotional influences as fear or pain, intoxication, the effects of the disease which made the operation necessary, and the absorption of toxic products of autolysis or of infection from the areas of damaged tissues. The relative importance of these factors varies in each case and they operate in varying combinations in different cases.

It is now recognized that the occurrence of such factors is not limited to traumatic injuries, burns and the aftermath of extensive surgery. I have emphasized repeatedly that the same mechanisms operate in severe infections, metabolic intoxications, abdominal emergencies such as intestinal strangulation, mesenteric thrombosis, perforation, peritonitis, and from the effects of various poisons.

CIRCULATORY DYNAMICS

Students of capillary physiology have supplied a satisfying explanation of the mechanism by which various toxic agents produce circulatory deficiency. Capillary endothelium is delicately susceptible to the effects of various noxious agents and conditions. These include bacterial substances, foreign proteins and protein-split products, extracts of normal tissues, histamine, bile, venoms, poisons, metabolic products and even moderate lack of oxygen. It was established that any kind of injury to endothelium, increases its permeability to the plasma colloids.

Permeability of capillary endothelium lowers both the actual and the effective blood volume. Leakage of plasma into the tissue spaces reduces the *actual* blood volume and causes hemoconcentration, while sequestration of blood by stasis in dilated capillaries and venules reduces the *effective*

blood volume. This combination leads to a disparity between the volume of blood and the volume-capacity of vascular bed. Such a disparity produces a circulatory deficiency superficially resembling that resulting from hemorrhages. Physiologic reactions compensate for minor degrees of such a deficiency. Activity of the sympatho-adrenal system causes arterial constriction, stimulates cardiac function, and causes the spleen to contract, discharging its reserve of blood into the circulation. Selective distribution of blood favors the vital organs at the expense of non-vital parts. Peripheral circulation is reduced, and the external parts become pale, cold and almost pulseless.

So long as this compensation is effective, there is no marked decline in the arterial blood pressure but the latter is maintained at the expense of the volume flow. Stagnation of circulation in the

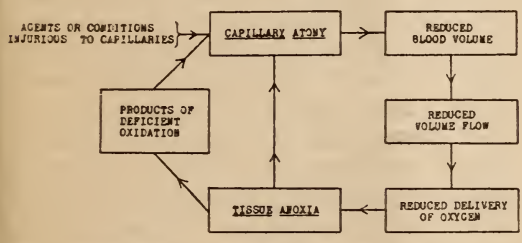

DIAGRAM 1. *A Vicious Circle in Shock*

(From Moon, V. H., Shock and Related Capillary Phenomena. London & New York, 1938. Courtesy of the Oxford Press.)

dilated capillaries reduces the amount of venous blood returned to the heart. This lessens the cardiac output and decreases further the volume flow. A reduced delivery of oxygen to the tissues follows, with accompanying anoxia which of itself caused further relaxation and permeability of capillary endothelium (Krogh, Landis). This feature introduces a self-perpetuating factor into the mechanism, causing it to progress as a vicious circle. When finally the compensatory reactions are no longer adequate, the blood pressure declines progressively and the complete syndrome of shock is manifested clinically. The items which constitute that syndrome were tabulated in a preceding section.

THREE IMPORTANT FEATURES

Three major physiologic disturbances accompanying shock, have received inadequate attention. First among these is a disturbance of fluid balance. Several forces are concerned with movement of fluid between the blood and the tissues in either direction. Chief among these are capillary blood pressure and the osmotic attraction of the plasma colloids. The operation of these forces requires the presence of a semi-permeable membrane—the endothelium. Immediately as the endothelium becomes permeable to colloids, the force known as osmosis ceases to act and the vital mechanism of fluid balance can no longer function.

This derangement affects other physiologic processes. Absorption of fluid both from the tissues and from the gastro-intestinal tract is impaired. Fluids given by mouth are not absorbed but soon are vomited; if given parenterally the fluid remains in the tissues where injected. The plasma lost by leakage through permeable capillary walls is not resorbed; the mechanism which controls the volume and concentration of the blood is deranged; hemoconcentration and tissue edema follow. Numerous writers, since the time of Heidenhain and of Starling have noted these features and have confirmed the fact that injury to endothelium causes a marked increase in the flow of lymph accompanied by hemoconcentration.

One function of fluid balance maintains the volume and composition of the blood at normal levels. When fluid balance is deranged, as by abnormal permeability of capillary endothelium, fluid leaks out into the tissue spaces. This reduces the volume of the blood and increases the numerical count of erythrocytes—a condition known as hemoconcentration. This is illustrated in the diagram on page 118.

We have shown (9a,d,e) that hemoconcentration is the earliest detectable sign of shock and a valuable index of its degree or severity. Many authors now advise observations on the concentration of the blood as a guide to the use of plasma or of transfusions in treatment.

A derangement of the mechanism of electrolytic balance likewise accompanies shock. Physiologists and cytologists have supplied information on the mechanism by which this occurs. It has been shown that the outer surface of normal cells functions as a semi-permeable membrane; that some vital property of living protoplasm maintains chemical concentration *within* the cell, differing markedly from those of the external fluid (Gamble). This property is decreased by lack of oxygen or by any kind of damage to the cell; the property is lost entirely as the cell dies.

For example, the cellular and extra-cellular

fluids differ markedly in their content of potassium and of sodium. The approximate degree of this is shown in the following ratios:

K (cellular): K (extra-cellular) = 21:1
Na (cellular):Na (extra-cellular) = 1:30

The effects of anoxia or of other deleterious agents render the protoplasm incapable of maintaining these differences in ionic concentrations. Immediately there is a movement of ions from the region of the higher to that of the lower concentration, tending to equalize them. Obviously this will increase markedly the potassium content of the plasma and decrease likewise its content of sodium. The concentration of other ions, both acid and basic, is affected in a similar fashion.

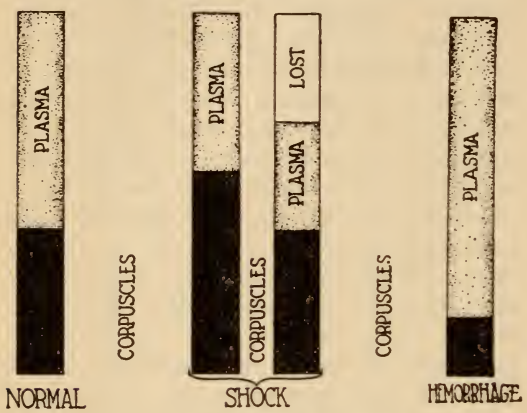

DIAGRAM 2. *Hemoconcentration*

A volumetric comparison of normal blood with that present in shock and that resulting from hemorrhage.

If normal blood (first column) becomes concentrated 40 per cent, it will have the composition shown in the second column. Seven cc. of such concentrated blood will contain the same volume of corpuscles (third column) as 10 cc. of normal blood, 3 cc. having been lost. In shock with hemoconcentration of 40 per cent, the normal blood has lost 30 per cent of its *total volume* and *50 per cent* of its *plasma volume.*

The fourth column illustrates the hemodilution which occurs when the corpuscles have been reduced by hemorrhages to 40 per cent of the normal. (From Moon, V. H., Shock, Its Dynamics, Occurrence and Management, p. 100. Philadelphia, 1942. Courtesy of Lea & Febiger.)

Chemical changes of this kind have been demonstrated in the blood plasma during shock from various causes. The same injurious agents which disturb fluid balance by affecting the endothelium, may also disturb chemical concentrations by increasing cellular permeability. The former effects result in shock accompanied by hemoconcentration; the latter effect provides a satisfying explanation for the accompanying chemical alterations in the blood and tissue fluids.

Now and again doctors are advised to maintain fluid balance and to correct disturbances of chemical composition in the blood and body fluids of patients who are gravely ill. One questions whether this advice arises from an accurate understanding of how such disturbances develop. The proposed methods for reëstablishing fluid balance and correcting the chemical disorders, certainly do not affect the mechanisms involved. To inject saline fluids, hoping to correct the disordered function, is like turning fire extinguishers upon the smoke rather than upon the hidden flames.

A grave defect in renal function is the third item of importance. In shock from diverse causes, this is evidenced by oliguria or anuria, by a progressive accumulation of nitrogenous wastes in the blood and by casts, debris, albumin and other abnormal findings in the urine. Renal deficiency becomes prominent when patients survive for several days in a state of sublethal shock. It frequently happens in such cases that defective renal function comes to dominate the clinical picture; excretion is inadequate, the non-protein nitrogen rises progressively, hyperazotemia develops and the clinical syndrome of uremia precedes death. This is exemplified in crush injuries, in non-fatal shock from trauma or from burns, intestinal obstruction, metabolic intoxication as in diabetes, icterus gravis, toxemia complicating pregnancy, anaphylactic reactions, transfusions with incompatible blood, poisoning with various drugs, and in severe infections.

Perhaps the most striking examples of sublethal shock leading to azotemia, are those of "crush injuries" reported by our British colleagues. Victims of air raids had been pinioned under masonry and debris for hours. Some of these had no broken bones nor open wounds, but suffered the effects of prolonged pressure upon the limbs. When rescued they developed signs of shock, which were counteracted by modern treatment. Despite the fact that adequate systemic circulation was maintained, these cases developed the complete syndrome of uremia and died from progressive renal insufficiency.

At necropsy such cases showed the pattern of congestive, edematous visceral changes which are characteristic of shock. The traumatized muscles

were pale, friable and necrotic. The kidneys were pale, swollen, streaked with red and showed marked brownish pigmentation. The urine was loaded with the same pigment. Later this was shown to be *myoglobin*, not hemoglobin; its source as derived from damaged muscle is *prima facie* evidence of absorption from the traumatized areas.

This type of renal disorder was known to Osler and his contemporaries as 'acute parenchymatous nephritis.' They recognized its occurrence under the conditions previously mentioned. Modern writers discuss the same syndrome as *"extra-renal uremia."* Pathologists have no appropriate designation for the renal damage; many speak of it, rather vaguely, as nephrosis. Bell discussed and exemplified this syndrome as *'clinical acute nephritis.'*

The exact nature and pathogenesis of renal failure, accompanied by parenchymatous degeneration and necrosis in otherwise normal kidneys, as a complication of sublethal shock, is a subject for future investigations. There is suggestive evidence that the same injurious agents, including toxins and anoxia, which cause circulatory failure by their effects upon endothelium, likewise cause renal failure by their effects upon the parenchyma of the kidneys. If so, then this condition is analogous to that resulting from the effects of other poisons which cause degeneration and necrosis of renal tubular epithelium.

Several major derangements are present regularly in shock. These may be used in a definition to distinguish it from other conditions. Such a definition might read as follows:

Shock is a disturbance of fluid balance resulting in a peripheral circulatory deficiency which is manifested by a decreased volume of blood, reduced volume flow, hemoconcentration and by renal functional deficiency.

CLINICAL IMPLICATIONS

Attention is now invited to the clinical application of the principles outlined above. It would be presumptuous for one who is neither internist nor surgeon to advise concerning clinical methods or to proffer instruction in surgical technique. But successful management depends essentially on its relation to causation. Those who are conversant with the pathogenesis of a disease are competent to appraise the bearing of clinical methods upon its causative factors, and to compare with that appraisal the recorded experiences of physicians. May I be pardoned for a brief digression to draw a comparison?

Those who pilot ships through dangerous waters, are guided by charts showing the location of reefs, shoals, channels and currents. In early days, the charts were made by navigators who had learned the channels of safety by experience; in modern times the charts are drawn by surveyors who have measured and plotted with meticulous care, each detail of that coastal region. The surveyor may never have piloted ships through the channels shown on his maps, and the navigators seldom inquire whether he had done so.

The clinical management of shock depends primarily on a comprehension of the various conditions under which it may develop and on the prevention of these when possible. 'The best treatment for shock is prevention.' Of prime importance is the recognition of the various conditions in which shock may develop. Hence not only after trauma, extensive surgery or burns but also in severe infections, intoxications, and in abdominal emergencies such as thrombosis, strangulation, perforation, and the like, the anticipation of shock may make its prevention possible.

Early amputation of mangled limbs, debridement of lacerated wounds, prompt local treatment of burns by coagulation, surgical relief of an infarcted or strangulated loop of bowel, and the drainage of infected areas, are procedures which may forestall the development of shock. Likewise the prevention of infection, by therapeutic or other means, removes a potent contributory factor.

The careful surgeon reduces the danger of shock by reducing to the minimum both the depth and the duration of anesthesia and by using regional or local anesthesia when possible. General anesthesia usually will not of itself cause shock; but it often leaves a narrow margin of safety when combined with other shock-producing conditions.

The successful management of shock requires primarily that the conditions which caused it shall be obviated or removed; otherwise, efforts to restore the failing circulation are predestined to failure. For example, unlimited quantities of plasma probably would not prevent death from intestinal strangulation or from a crushed and mangled limb unless those conditions could be obviated effectively.

In the treatment of shock, the first essential is an accurate differential diagnosis between three conditions which commonly result from wounds

and which present similar clinical features. These are: (1) primary or initial shock, (2) the effects of hemorrhages and (3) true shock, otherwise known as secondary, delayed or traumatic shock.

Hemoconcentration is most valuable for differentiation. It may be shown either by counts of red blood cells, by hemoglobin readings, by hematocrit or by the specific gravity of the whole blood. If means are lacking for making either of these, then hemoglobin estimation by the simple Talquist scale may serve the purpose adequately. Whatever method is used, a reading should be made when the injured patient is first seen. Subsequent readings at intervals of one or two hours will indicate both the degree and the progress of the condition when either shock or hemorrhage is affecting the circulation.

Primary or initial shock is essentially similar to fainting or syncope. It is due to a vasomotor reaction which may be excited by pain, fright, grief, the sight of blood or of a mangled wound. The victim often manifests the clinical signs of true shock, including weakness, pallor, perspiration, a feeble rapid pulse and low arterial pressure. This condition develops immediately after the injury and it is usually transient, while true shock develops slowly but tends to progress. Primary shock usually requires no treatment other than quiet and rest in a horizontal position. In cases of severe abdominal or cranial injuries, primary shock may merge over into true or delayed shock without an interval of partial recovery. Primary shock is not associated with capillary atony or endothelial permeability; hence it does not produce concentration of the blood. The lapse of time between the injury and the circulatory disturbance, and the presence or absence of hemoconcentration are valuable points of distinction between primary and secondary shock.

Severe hemorrhages will cause clinical signs like those of secondary shock. They may be differentiated by the fact that *hemo-dilution occurs immediately* after hemorrhages, and the degree of dilution is proportional to the amount of blood lost. If the hemoglobin and red blood cells are not reduced below 50 per cent, an otherwise healthy person will recover spontaneously. Fluids by mouth or intravenously, or transfusions of blood or of plasma will hasten recovery. If the hemoglobin is much below 50 per cent, a transfusion of blood should be given. It is remembered that hemoglobin below 30 per cent indicates a critical condition.

True or secondary shock requires several hours for development. It is seldom seen within 4 hours except following abdominal or cranial injuries; for this reason it is often called delayed shock. A marked and progressive decline in blood pressure is emphasized by most writers as the characteristic sign of shock. This *is* true in the same sense that wide-spread metastases are a sign of carcinoma. Many surgeons and experimentors have observed and emphasized that, in the early stages of shock *there is a rise in the arterial blood pressure* following injuries or burns. Blalock states that the blood pressure is an inadequate guide to the state of the circulation in incipient shock. So long as the mechanism of compensation is effective, there is no serious decline in arterial pressure; when the latter develops it indicates that the mechanism of compensation is failing and that the condition is becoming critical. An ominous fall in blood pressure is not a sign of incipient shock; often it is a sign of departed opportunity!

The incipient stage of shock may be detected by the presence of moderate hemoconcentration, 10 to 20 per cent, even before any evidence of circulatory deficiency is manifested clinically. This finding will serve to distinguish it from either primary shock or from the effects of hemorrhages.

Several therapeutic misconceptions are prevalent concerning shock. There is no basis for the belief that morphine is useful in counteraction or prevention. On the contrary, morphine is dangerous when given in full doses because it inhibits respiration and thereby increases anoxia which is a major factor in this condition. Sufficient morphine should be given to allay pain and apprehension but amounts sufficient to lower the respiratory rate, will accelerate the development of shock.

Repeated experiences have shown that stimulants, such as digitalis, strychnin and adrenalin, are not only useless; they may be distinctly harmful. Cardiac deficiency is not a factor in the development of shock; the vasomotor system is active and the peripheral arteries are already contracted to the maximum. Under such conditions adrenalin can not be expected to produce benefit and it should be remembered that, in large or repeated doses, this will actually cause shock in experimental animals.

Another matter deserving thoughtful consideration is the application of heat in attempts to prevent or to counteract shock. It is natural that physicians should note the low peripheral circulation and temperature and should try to relieve

them artificially. The application of heat is widely practiced, perhaps without due consideration of the physiologic principles involved. During shock and after hemorrhage the blood volume is reduced. There is insufficient blood to fill the entire vascular bed and to support metabolism throughout the body. Physiologic reactions compensate for this condition by a selective redistribution of blood, favoring vital organs at the expense of the external parts. The vascular channels in non-vital areas become collapsed and bloodless, but both circulation and metabolism are maintained where they are needed.

It is possible to open up the entire peripheral vascular bed by the application of heat and stimulants. But this counteracts nature's mechanism for conservation; the blood required to fill this vascular area, lowers needlessly the already depleted reserve of blood. Recent evidence, both experimental and clinical, indicates that the use of heat in the treatment of shock causes further circulatory deficiency and that the results are detrimental.

Those remedies which have proved useful are agents which tend to counteract one or another of the major items by which shock develops or progresses, chief among these items are *anoxia, endothelial permeability* and *reduced blood volume.* Lack of oxygen accelerates the development and progress of shock. The inhalation of oxygen aids in counteracting this and in preventing irreparable damage. It raises metabolic activity and tends to interrupt the action of the vicious circle even after shock has been initiated.

One function of the adrenal cortical hormone is to maintain the normal impermeability of endothelium. There is significant evidence, both experimental and clinical, that this substance is distinctly beneficial in the prevention and in the treatment of shock.

The successful treatment of shock requires, first, that the condition which caused it shall be removed; next, that the fluid which was lost from the blood be replaced by fluid which should approximate closely the composition of that lost; thus after serious hemorrhages transfusions of whole blood provide the ideal remedy. But in shock accompanied by hemoconcentration, whole blood is not so suitable; it does not relieve the hemoconcentration which, because of viscosity, tends to impede circulation through the capillaries. The patient does not lack erythrocytes but he sorely needs fluid to restore the blood to its normal composition and volume. These considerations indicate clearly that the ideal replacement fluid is either human plasma or serum.

These substances are now available in most hospitals and medical centers, either in the original form or concentrated or dehydrated. Plasma or serum, given in the normal or isotonic concentration, serves admirably as a replacement fluid to restore blood volume and to reduce hemoconcentration. But the same amount of plasma, concentrated to $\frac{1}{2}$ or even to $\frac{1}{5}$ its original volume, is far more effective in counteracting both the low blood volume and the deranged equilibrium of fluids which are prominent factors in the mechanism by which shock develops.

Concentrated plasma or serum given intravenously, raises the osmotic pressure of the blood and thereby draws fluid from the tissues into the vascular system. This accomplishes several desirable results: it increases directly the total blood volume; it relieves the hemoconcentration, reduces the viscosity of the blood and restores fluid balance; it tends to reduce the edema of soft tissues; it also relieves the hypoproteinemia which often is a notable feature. These effects increase the circulatory efficiency and the delivery of oxygen to the tissues. The relief of anoxia removes a most important factor from the vicious circle by which the deficiency progresses.

The foregoing conclusions are not based upon personal experiences. They represent an analysis of the mechanisms involved, and a comparison of these with the recorded experiences of physicians and surgeons.

The clinical use of plasma or serum has established beyond question the effectiveness of this treatment for shock following surgical procedures, accidental injuries, burns, air raid casualties and battle wounds. Recent figures released from the Surgeon General's office, indicate that the mortality among wounded soldiers is 2.7%. In other words, of every 1000 men wounded, only 27 die. Even lower mortality is reported from wounds and burns among the naval forces. These remarkable results are attributed, first to the prompt use of plasma, second to early and proper surgical treatment of the wounds, and third to the use of sulpha drugs.

In closing, let it be emphasized that *early* recognition and treatment are of the highest importance if favorable results are to be hoped for. Treatment, to be effective, must anticipate the complicated interplay of the agencies whose combined

effects culminate in the syndrome of shock. It must be administered before the failing circulation and the associated anoxia have produced irreversible changes in tissues whose functions are vital.

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The First Fifty Years of the Section on Otolaryngology of the College of Physicians of Philadelphia*

By GEORGE B. WOOD, M.D.

IN HAVING been asked to prepare a review of the origin and activities of the Section on Otolaryngology of the College of Physicians I feel myself greatly and also unduly honored. This is the 50th Anniversary of our Section and at the time of its inception there were in this city no societies devoted to our specialty. The organization started by J. Solis-Cohen in 1881 and known as the Philadelphia Laryngological Society had ceased functioning in about 1887. However, about 1911 the Philadelphia Laryngological Society was reorganized and has had a very active career ever since. I desire at this time to pay tribute to the important part it has played in the advancement of Otolaryngology. However, tonight we speak only of our Section as this is its anniversary we are celebrating. It might have been of interest to have interpolated into this history of our Section short biographical sketches of the more prominent pioneers. There would, however, not have been the time or space for such biographies and, for the majority of us, mere mention of their names is sufficient to make us realize the giants that started our Section and steered its early course.

The story of the beginning of the Section on Otolaryngology of the College of Physicians and its continued activity from the time of its formation to the present day is closely associated with the rise and progress of our specialty in Philadelphia. At the time of its organization, the need for specialization was being more and more recognized though there were no systematic courses for specialized training and every physician who desired to specialize had to work out his own salvation in clinic and laboratory. In spite of these handicaps there developed a group of men in Philadelphia whose names have been handed down to posterity as truly great otolaryngologists. It is natural that such men, believing in the more complete development of otolaryngology as a special branch of medicine, should feel the necessity of an opportunity for the pooling of ideas and clinical experiences as would be afforded by regular meetings entirely devoted to this subject.

As the membership of the College of Physicians at that time included the leading exponents of our specialty, the teachers in our medical schools and the chiefs of the otolaryngological departments of the various hospitals, it was logical and proper that the desired meetings should be a part of this institution, i.e., that a section of the College be organized devoted to the study of and the promulgation of the various subjects of otolaryngology.

Chapter XIII, Section 1, of the BY-LAWS of the College of Physicians, states that "Whenever fifteen Fellows of the College shall, in writing, certify to the President their desire to have organized a Section upon some department of medical science or practice, he shall, if in his judgment it seems wise, direct the Secretary of the College to announce the creation of such a Section." Therefore, there was sent to the President in the fall of 1893 a petition asking for the organizing of such a Section. It was signed by J. Solis-Cohen, Harrison Allen, George C. Harlan, Samuel D. Risley, Alexander W. MacCoy, Ralph W. Seiss, S. Solis-Cohen, Louis Jurist, Eugene Vansant, Charles Shaffner, Walter J. Freeman, Joseph S. Gibb, Frank Woodbury, B. Alexander Randall and F. M. Perkins. On December 12, 1893, Dr. S. Weir Mitchell, then President of the College, appointed as Executive Committee of said Section, J. Solis-Cohen, Charles H. Burnett and B. Alexander Randall.

The first meeting of the Section was held on December 20, 1893, in the hall of the College at 13th and Locust Streets. There were present: J. Solis-Cohen, Harrison Allen, Alexander W. MacCoy, S. Solis-Cohen, Louis Jurist, Ralph W. Seiss, Walter J. Freeman, Charles Shaffner, Howard F. Hansell, Joseph S. Gibb and B. Alexander Randall. There were also present as invited guests: A. H. Cleveland, George C. Stout and Barton H. Potts. Dr. Harrison Allen was elected Chairman and Dr. Burnett, Clerk. After organization, the scientific part of the meeting in-

* Read before the meeting of the Section on Wednesday, December 15, 1943.

cluded a demonstration by Dr. Randall of the method of making casts of the nasal sinuses, pharynx, larynx, bronchi and auditory canals by the galvanic coating of copper over the original cast. Dr. J. Solis-Cohen reported the removal of a sarcoma through the mouth with no sign of recurrence "after months" and in the discussion of this paper Dr. MacCoy referred to a case of malignancy too extensive for operation which was treated by the injection of Pyoktanine with disappearance of the mass and associated enlarged lymph nodes.

The business part of the meeting included a resolution concerning the date of future meetings, the first Tuesday of the month being preferred but the third Wednesday was voted as an alternative date. There was also a debate as to the wisdom of employing a stenographer to report the discussions but it was decided "that members could reduce to writing their own remarks."

Thus our Section was conceived and born and from that day to this it has had an enviable career playing an active and integral part in Philadelphia otolaryngology. To realize this relationship it is only necessary to look over the membership and especially to review the names of those men who during the years since its formation acted as Chairmen. This is an impressive list of many of the leaders of Philadelphia otolaryngology.

Chairmen	*Elected*
Harrison Allen	1893
C. H. Burnett	1896
E. L. Vansant	1898
Alexander W. MacCoy	1900
B. A. Randall	1901
D. Braden Kyle	1905
J. S. Gibb	1907
A. W. Watson	1909
Arthur A. Bliss	1912
George M. Marshall	1914
George C. Stout	1916
S. MacCuen Smith	1918
E. B. Gleason	1920
George B. Wood	1921
George Fetterolf	1923
Fielding O. Lewis	1926
James A. Babbitt	1927
George M. Coates	1929
Ralph Butler	1931
Benjamin D. Parish	1933
Walter Roberts	1935
Curtis C. Eves	1937
Warren B. Davis	1939
Karl M. Houser	1941
Gabriel Tucker	1943

In the organization of the sections of the College the chairman is the presiding officer and it is probable that the Executive Committee has a due regard for his desires and opinions in the arrangement of the programs and other necessary business but the actual hard work and labor is done by the clerk. Further, while the term of office of the chairman, with a few exceptions, has been limited to two years, that of the clerk usually extends over a greater length of time. This fact gives him an experience and understanding so that all things considered the clerkship is probably the most important office in the sectional organization. To the following gentlemen who as clerks gave of their time willingly and with loyal devotion the Section owes much of its success.

Clerks	
C. H. Burnett	1893
E. L. Vansant	1896
Frank Woodbury	1898
Francis R. Packard	1902
B. H. Potts	1906
Ralph Butler	1909
Benjamin D. Parish	1914
George Coates	1917
Nathan P. Stauffer	1918
James A. Babbitt	1923
Curtis C. Eves	1927
Frederick M. Strouse	1929
Karl M. Houser	1931
William Hewson	1937

At the time of the formation of our section there was apparent a certain exclusive pride in being a Fellow of the College that led to one restriction which happily was of very short duration. The first Card of Notice for a meeting was that of February 6, 1894 and this card was similar to those used for many years except that it had printed at the bottom: "A part of Section Six of the Rules of the College governing Sections to wit: No person not a Fellow of the College shall attend any meeting of the Section except by specific invitation to that meeting by a Fellow who shall give the name of the visitor to the Clerk of the Section and be responsible for the visitor's actions at the meeting."

However, in spite of this restriction there were present at this first meeting as invited guests, Dr. Ring, Dr. Hammond, Dr. Rowan and Dr. Cleveland. I suppose the responsibility for the visitors' actions was more than the members could bear, because this particular paragraph was omitted from the Card of Notice on December 11,

1894 and never again reinstated. However, the names of guests were faithfully recorded in the Minutes of the meetings up until November 1900.

The membership of the Section gradually increased in number from the original 15 in a steady curve up to 1913 when there were 27 active members. Then, probably because of the war, the membership remained the same until about 1922 when it again started to rise, reaching 38 in 1926. In 1918 there were only five meetings held as many of the active members of the Section had volunteered in the military service of the United States. This list included Drs. Babbitt, Coates, Fetterolf, Jones, Lewis, Packard, Parish, Vail and Wood. For that year the average attendance was only 8 Fellows and 17 guests. The attendance by the Fellows of the College at the meetings varied somewhat throughout the years but as a rule there was an average attendance of about one-third of the full membership and in some years it reached almost 50%. Interest in the meetings was not limited to the members only, as shown by the record of guests attending the meetings who about 1905 began to outnumber the Fellows. There was a sudden increase in this extramural interest in the meetings of the Section about 1917 as shown by the very marked jump in the number of guests who attended the meetings. In that year the average attendance of the Fellows was 13 and the guests 50 which was triple the guest attendance for the year before and the proportion of guests to members has remained approximately the same ever since that time. The greatest average attendance for guests was in 1921 when it was 66+ per meeting.

It might be of interest to note the various subjects that were taken up at these early meetings and we find that many of the same questions were being discussed by specialists in those days as they are today. For instance, infectious diseases of the middle ear with complicating mastoid, intracranial and labyrinthian involvements, occupied an important space in the meetings. There was one quite significant paper by Burnett, "The Synopsis of 26 Cases of Chronic Tympanic Vertigo and Tinnitus Relieved by Intratympanic Operations." Then there were many papers on malignant disease; on anatomy and histology; on the technique of intranasal operation; some on foreign bodies in the nose and esophagus and so on. At the meeting held on February 6, 1894, a case of brain abscess was reported by Dr. Randall with recovery and another similar case reported by Dr. Burnett, operated upon by Dr. DeForest Willard, also with recovery. In 1899 Dr. Vansant reported on "The Use of Dried Extract of Suprarenal Capsule in Nasal Surgery." This was one of the earliest communications concerning this important drug.

The minutes of the early meetings were written by the Clerk in long hand and most of them oddly enough are clearly legible. However, there were times when apparently no minutes of the meetings were kept at all, at least none have been preserved. In 1902 the mechanical progress of chirography was evident as the minutes of the meeting of January 15th of that year were typed as were all the minutes from that date on.

The early Section expenses were not very great and usually consisted of only two items, one amounting from $40 to $50 for printing of the post cards and the other 10 to 40 cents to the janitor for washing towels. Annual dues were $3.00 and it is interesting to note that frequently the members of the Section were spoken of as subscribers.

From quite an early date in the history of the Section, prominent otolaryngologists and other specialists from all over the country and sometimes from abroad were invited to read papers before the meetings. In 1902 Dr. Charles Richardson and Dr. Joseph H. Bryan of Washington were entertained and since then almost every year one or two prominent personages were asked and willingly gave us of their knowledge and experience. There were James F. McKernon, Henry L. Swain, J. L. Goodale, Harmon Smith, Gorham Bacon, John E. Weeks, Arthur B. Duel, Seymour Oppenheimer, Mark J. Gottlieb, H. P. Mosher, Wendell C. Phillips, H. L. Lynch, J. S. Frazer of Edinburgh in 1923, Georges Portmann of Bordeaux (also in December 1923), Wells P. Eagleton, F. M. Law (the pioneer in the x-ray diagnosis of sinus disease), A. G. Pohlman, M. A. Goldstein (who gave that memorable demonstration on "Modern Methods in Education of the Deaf Child"), Richmond McKinney, S. W. Crowe, Henry H. Forbes, D. Bryson Delavan, W. H. Sears, William V. Mullen, Simon L. Ruskin, P. F. Flagg, John H. Evans, C. M. Brown, W. E. Dandy, and Joseph C. Beck.

This is only a partial list but it represents the type of men who honored us with their instructive papers and demonstrations. The guest speakers from out of the city of course attracted considerable attention to our sectional meetings and at those times the attendance showed our appreciation. Almost always the guests were entertained by a pre-meeting collation.

We will always be proud of the fact that our own Philadelphia colleagues, internists, surgeons and specialists would willingly and graciously attend our meetings to give us of their knowledge either by reading papers or taking part in discussions; and especially are we beholden to Philadelphia otolaryngologists not Fellows of the College who by their presence and participation in our meetings greatly contributed to the enrichment thereof.

The first effort to have combined meetings with other societies was in 1911 when, with Dr. George de Schweinitz in the chair, we held a combined meeting with the Section of Ophthalmology. In 1924 there was instituted an annual joint meeting with the Section of Otology and Laryngology of the New York Academy of Medicine. This first meeting was held in Philadelphia and papers were read by Drs. Jackson, MacCuen Smith, Charles H. Frazier, George Fetterolf, James Babbitt and George Pfahler. The discussion of the papers was done by the members of the New York Academy of Medicine. This meeting was a great success, in fact so much so that it was an annual feature of our sectional program up to 1943 when it was mutually agreed to omit it for the duration of the war. These meetings were held, alternating each year, in Philadelphia and New York and it was the custom for the entertaining society to present the papers and the visitors to discuss them.

There was another innovation which was tried for several years but was discontinued not on account of its lack of popularity but partially because it did not quite seem a proper activity for a dignified Section of the College of Physicians. These were called Clinical Meetings. The first one was held at the Pennsylvania Hospital on April 16, 1919 and in the same year one was held at the University Hospital on November 26th and in 1921 at the Jefferson Hospital.

These Clinical Nights were characterized by operative demonstrations by the Fellows of the Section and it is possible that an operative fatality at the Jefferson Hospital may have been the deciding factor in their abolishment.

In 1925 it was decided to replace the regular May scientific meeting with a dinner limited to the Fellows of the Section and to the social enjoyment of each other's company. That year it was held at the Art Club and a good time was had by everybody. While this festivity was repeated a few times it did not become a regular feature.

There is no need for me to review the further progress and activities of our Section through the recent years. You of the audience are part and parcel of its achievements, and your success in carrying on is self evident. You now boast an enrollment of 56 Fellows and there has been established throughout the country a reputation collectively and individually that makes us proud and happy. Again, as in 1918, many of our Fellows have given up their active and lucrative practices to risk their lives and future in the service of their country. Let us pause for a moment as we salute these of our fellowship: Edward H. Campbell, C. E. Cornelius, Robert J. Hunter, Harry P. Schenck, Louis E. Silcox and Austin T. Smith.

Because of the present war we have found it necessary to curtail some of our activities. We have joined with the Philadelphia Laryngological Society in combined meetings, thus saving needed hours for other purposes and adding interesting and instructive experience to the meetings. We of the Section are glad of this opportunity to meet with our fellow otolaryngologists in comradeship and in debate and discussion.

The Section on Otolaryngology has the heritage of great and progressive achievement and this is a stimulus that will greatly help us to carry on through these days of world disruption. Our minds are occupied with the details of the human struggle for right and freedom; our souls are numbed by anxiety and sorrow, and our days filled with an excessive burden of professional work; but we shall find time and interest to keep the activities of this Section alive and virile. But as we look forward to the day when strife shall have ceased and peaceful pursuits shall once more be the predominating motif of living, it is on you of the younger generation that must lie the responsibility of our Section's future progress.

REMINISCENCES BY WALTER ROBERTS, M.D.

When Dr. Wood found my name on one of the papers presented before this section of the college in 1899, he jumped at the conclusion that I must be one of the "old fellows" and asked me to reminisce a little. I do not remember presenting such a paper but if the records show it, it must be correct. In those days our meetings were held at the old College of Physicians located at 13th and Locust Streets. We had a very small meeting room about 12′ x 15′ square. The membership was about 15 and usually 8 or 10 members were present.

The first chairman was Dr. Harrison Allen. I was not then a member of the section and although I had heard a great deal about Dr. Allen I did not know him personally. Dr. Charles H. Burnett, the first clerk was a quiet, reserved scholarly man. He was a well dressed bearded gentleman who frequently took part in the Society discussions. He was well and widely known.

Dr. Eugene L. Vansant was a tall good looking gentleman who wore thick glasses and had a rather prominent moustache. He was a very good otolaryngologist and frequently condescended to give us younger men some very valuable advice. His later years were marred by a tragedy in his family. His son while bathing at the shore was attacked by a shark and so severely mangled that he died. Dr. Vansant felt the loss of his son keenly and he was never quite the same thereafter.

Dr. Alexander W. MacCoy was my chief during my interneship at the Pennsylvania Hospital and after leaving the hospital I helped him in his nose and throat dispensary for six years. He was a tall well dressed gentleman who never seemed to be in a hurry. He was well known nationally, having been president of the American Laryngological Society.

Dr. B. Alexander Randall, I knew him very well. He was professor of Otology at the University of Pennsylvania during my student days. After I graduated and had finished my interneships, I joined his clinical staff at the old Polyclinic Hospital. Fortunately about this time he was giving up his Otological work at the Methodist Hospital and recommended me to take his place. I well remember how he kindly returned to help me in my early mastoid cases. For many years he was my consultant; I turned to him whenever I needed help. He was a very skillful operator, although many people thought him too conservative. He felt that many of the complications of mastoid surgery were due to too early and too radical operating. I never knew he had a hobby until one day he took me through his cellar and showed me his shooting gallery. He was very fond of rifle shooting and was a good shot.

Dr. Ralph W. Seiss was a tall smooth shaven gentleman, always rather stylishly clad. He had an impressive manner of speaking and had a great respect for his own opinions. I got along rather well with him because I made it a point never to argue. In spite of his conceit he had a large practice among the wealthy and high society people of Philadelphia. He did no operating but he had a gentle touch and was most skillful in giving pleasant local treatments. He had a wonderful collection of sprays for eliminating all kinds of local pathology. When he was sick I took charge of his practice and greatly enjoyed the experience. His prices were not exhorbitant; his wealthy patients paid him $5.00 a visit, but the majority of them paid $4.00. He made many house visits for which he usually charged $6.00. He was quite a horseman and most any afternoon could be seen driving his spirited horse harnessed to a yellow two-wheel cart with a liveried colored boy sitting by his side. He had a charming wife who entertained a good deal. Her dinner parties were very enjoyable occasions. He always took long vacations, generally in northern Maine and the Canadian woods.

Now, there are many other doctors about whom I would like to speak, but George Wood said I have talked enough.

Notes on the History of the Obstetrical Society of Philadelphia in the Present Century*

By LEWIS C. SCHEFFEY, M.D.

Professor of Gynecology, Jefferson Medical College

SEVENTY-FIVE years ago, almost to the day, a small group of Philadelphia physicians, especially interested in the practice of obstetrics and in the diseases of women and children, met together in the office of Dr. Albert Holmes Smith at 113 South Broad St., where the Real Estate Trust Building stands, obliquely opposite from the Union League. The evening was Saturday, and the date—June 6, 1868—was the birthday of the Obstetrical Society of Philadelphia. Only two similar organizations in this country are older than we are—the Obstetrical Society of Boston, founded in 1861, and the New York Obstetrical Society, formed in 1863.

On May 5, 1938, it was my honor and privilege, as your retiring President, to present a detailed history of the Society in recognition of the seventieth anniversary of the founding, the substance of which is familiar to most of you. I shall not presume on your patience by rehearsing what was said at that time, for the entire subject matter is recorded in the *Transactions & Studies of the College of Physicians of Philadelphia*,[1] reprints of which were sent to the entire membership of the Society for that year.

I wish that time would permit me to again refer to the constructive membership of men like Cleeman, Parry, Jenks, Ludlow, Parrish, the younger Hodge (the elder was an Honorary Member only), Baker, Baer, Drysdale, Montgomery, Parvin, Kelly, Price, Penrose, Baldy, Noble, Davis, B. C. Hirst, R. C. Norris and Shoemaker.

Instead, granting your indulgence, I shall speak of the membership of the Society and its accomplishments since the turn of the century, and pay our respects to those who have left our companionship since May, 1938.

In 1901, John C. DaCosta, uncle of the late J. Chalmers DaCosta, was serving his second presidential term, and many of the members, elected soon afterward, continue to participate actively in Society affairs, as do several who joined just before that date. I am especially pleased to mention the names of F. Hurst Maier, J. S. Raudenbush, William R. Nicholson, John A. McGlinn, J. O. Arnold, B. M. Anspach, C. C. Norris, S. E. Tracy, G. A. Ulrich, E. A. Schumann, Alice Weld Tallant, Catharine Macfarlane, E. P. Barnard, Norman Knipe, all of whom became members prior to 1910, and have been staunch supporters ever since. Many have served officially as officers. Those of us elected since 1910 must, therefore, still be regarded as the "youngsters" of the Society.

Of the honorary members, Daniel Longaker, elected in 1884, and President in 1915, is the Nestor of our group, and happily enough is with us this evening. So is William E. Parke, elected in 1893, and President in 1923. Elliston J. Morris, elected in 1889; W. Reynolds Wilson, elected in 1891; and Oliver Hopkinson, Jr.,[2] elected in 1895, leading retired lives, send their greetings to us, and regret their enforced absence from tonight's celebration.

Seven of our honorary members have passed beyond the horizon since our seventieth anniversary. Let me speak of them:

Addinell Hewson, Jr., (Jefferson, 1879) the fifth of consecutive generations of distinguished physicians and surgeons, died at the age of 83 on October 27, 1938. He was indeed a gentleman of the old school. Elected in 1888, and becoming an honorary member in 1938, Dr. Hewson maintained an interest in our specialty until his death. His primary services were devoted to anatomy, and he held professorships for varying times at Jefferson, Temple and the Philadelphia Polyclinic. Clinically he served as surgeon to several institutions. Probably his most outstanding contribution was the forty years of service that he gave to the Anatomical Board of Pennsylvania of which he was Secretary. In this capacity he aided in the formulation and maintenance of laws bearing on the use

* Read at the seventy-fifth-anniversary celebration of the Society, held at the College of Physicians of Philadelphia, June 5, 1943.

[1] Fourth ser., vol. 6 (1938–9), pp. 125–147; 292–316.

[2] Dr. Hopkinson, Jr. died on Oct. 9, 1943.

of unclaimed bodies in the furtherance of scientific medicine and was of tremendous help to the teaching institutions dependent upon his labors.

Alexander MacAllister (U. of P., 1885), friend and physician of Walt Whitman, also became an active member in 1888, and an honorary member in 1938. He graduated from the Philadelphia College of Pharmacy and Science before studying medicine, which he practiced in Camden for 53 years. For a long time he was Secretary of the New Jersey State Board of Medical Examiners. His interest in the Obstetrical Society never faltered; in addition to his professional achievements, his was a convivial spirit. Death came to him in the hospital of his Alma Mater on Nov. 22, 1938, at the age of 76.

Henry Middleton Fisher (U. of Pa., 1876) died on April 27, 1939 at the age of 87. Elected to the Society in 1875, he was, at the time of his death, the oldest living member, having become honorary in 1938. During his earlier life, Dr. Fisher's knowledge of foreign languages attracted many patients of foreign birth to him, for he had spent much time abroad. His continental experience interested him too in the economy of forestation and inspired him to become one of the founders of the Pennsylvania State Forestry Association. During his active professional life he served on the Staffs of the Pennsylvania and Episcopal Hospitals.

George M. Boyd (U. of Pa., 1882) was a most faithful and zealous member of the Society from the date of his election in 1888 to the time of his death, which occurred on a fishing trip on May 20, 1939 at the age of 77. In 1938 he became an honorary member. He was President in 1912 and again in 1913. As Assistant Surgeon to the Kensington Hospital for Women in 1888, he assisted Howard A. Kelly with the first cesarean section, successful for mother and child, that had been accomplished in Philadelphia in over fifty years. Professionally, Dr. Boyd's career was most successful. For many years he was a member of the Staff at the Philadelphia Lying-in Charity Hospital. He was full Professor of Obstetrics at the Medico-Chirurgical College from 1910 to 1916, and when the merger with the University of Pennsylvania was consummated he was appointed to the same position in the Graduate School, from which he retired in 1935. He was a Captain in World War I. A modest gentleman, Dr. Boyd was sincere, meticulous and gracious with all.

William S. Higbee (Jefferson, 1883), elected in 1900, and becoming an honorary member in 1938, died on September 13, 1939. During the 80's he was Medical Superintendent of the Sanitorium for Sick Children, and was President of the Pennsylvania State Board of Examiners for Registration of Nurses from 1909 to 1919.

Howard A. Kelly (U. of Pa., 1882), the dean of American gynecologists, elected to active membership in 1885, and to corresponding membership in 1890, becoming an honorary member in 1938, passed away on January 12, 1943 at the age of 84. A few hours later his wife died in an adjoining room of the Union Memorial Hospital in Baltimore. One could devote pages to a recital of Dr. Kelly's accomplishments, with which all of us are so familiar. Emeritus Professor of Gynecology at Johns Hopkins since 1919, he retained until his last days a zealous interest, not only in medicine, but to a great extent in religious and scientific endeavor. His powerful influence in the earlier days of the Obstetrical Society has been dwelt upon at length in our previous historical presentation; our tradition has been enriched by his association with us.

Wilmer Krusen (Jefferson, 1893) had a wide and varied career that terminated on Feb. 9, 1943 at the age of 73. Elected in 1895, he became an honorary member in 1930, serving two terms, as President, 1906 and 1907. After teaching gynecology at Jefferson for several years he became Professor of Gynecology at Temple University in 1902, later becoming Emeritus professor, as well as a trustee and vice-president of the institution. Dr. Krusen served two terms as Director of Public Health of Philadelphia (1916–20; 1924–28). In 1927, he became President of the Philadelphia College of Pharmacy and Science, retiring from active duty in 1941. He held several honorary degrees. A gifted physician and a versatile speaker, Dr. Krusen graced any group of which he was a member.

Frank A. Hammond (Jefferson 1895) died on April 12, 1941, aged 66. Elected in 1897, he served as Secretary from 1902 to 1913; in 1917 he was elected President. Leaving the Gynecological Staff at Jefferson in 1905, Dr. Hammond became associated with Temple University, being active Dean of the Medical School from 1910 until 1929, a position that he filled with decided credit. During the same period, he was first Clinical Professor, and later full Professor of Gynecology until his retirement in 1940. From 1924 to 1940 he was editor of the Pennsylvania Medical Journal. Dr. Hammond had a most engaging personality. In his later years, deafness handicapped him, so much so that he refrained from attending meetings. His

professional life was a full one; in addition to the positions mentioned he served on the staffs of numerous other institutions. It should be mentioned that he was a warm friend of Wilmer Krusen, whose distinguished son bears the name Frank Hammond Krusen.

Joseph E. Hoffman died in Philadelphia on Feb. 16, 1943, at the age of 88 and it was the newspaper notice that recalled his name to us. He was elected a member in 1887, and took an active part in the Society for many years. Dr. Hoffman was closely associated with Howard Kelly in the early days of the Kensington Hospital. We are proud to pay this rather belated tribute to his memory.

Of those members who joined the Society after 1901, a group who were especially active should be mentioned:

Edmund B. Piper (U. of Pa., 1911), elected in 1915 and President in 1924, lived bravely and died gamely. His early career was delayed by conspicuous service as a Major in the Medical Corps during World War I, for which he received a citation by General Pershing. After the war he resumed work in his specialty and soon attracted universal attention. His flair for invention resulted in the axis traction forceps that he devised. In 1927 he succeeded his Chief, Barton Cook Hirst as Professor of Obstetrics at the University of Pennsylvania. He held numerous other hospital appointments. Combating for years the handicap of cardiac disease, he would not let it interfere either with his professional activity or with his zest for life. He was an excellent teacher and a forceful clinician. Death came suddenly on January 15, 1935, at the early age of 54. When Norris Vaux retired as President of the Society in 1935, he presented a gavel made from the beams of the original Pennsylvania Hospital, wood 130 years old, engraved in memory of his friend Ned Piper.

Stricker Coles (Jefferson, 1892), *George C. Hanna* (*Medico-Chi*, 1895) and *William E. Darnall* (Univ. of Va., 1895) all passed away within a few months of each other, June 20, 1937, Sept. 13, 1937, and Dec. 27, 1937 respectively.

John H. Girvin (U. of Pa., 1892), who died on Oct. 23, 1938, aged 69, was son of Robert M. Girvin, one of the early members of the Society, whose father-in-law gave the land for the erection of the Presbyterian Hospital. He succeeded his father, as Gynecologist-in-chief to that institution and served as Associate Professor of Gynecology in the Graduate School of the University. His chief interests, however, lay in the activities of the College of Physicians. For several years he was Clerk of the Gynecological Section of the College that existed from 1895 to 1907. He served as Secretary of the College from 1919 to 1934.

Floyd E. Keene (U. of Pa., 1904) was called from our midst too soon. Elected to the Society in 1909, he served as President in 1931–32. Six years later on Nov. 16, 1938, death claimed him at the age of 57. Dr. Keene's unusual accomplishments and his fine character are so well-known to us that they need not be re-emphasized. His association with the late John G. Clark began in 1908, and was interrupted for a time by World War I, in which he served as a Major in the Medical Corps. In 1927 he succeeded the latter as the William Goodell Professor of Gynecology at his Alma Mater. In 1933, Dr. Keene became President of the American Gynecological Society.

Collin Foulkrod (Jefferson, 1901), a member respected for his splendid ideals and sound professional judgment died on Nov. 16, 1939, aged 65 years. He was President of the Society in 1930–31. At the time of his death he was Chief Obstetrician to the Presbyterian Hospital and Assistant Professor of Obstetrics at Jefferson. He was also a member of the American Gynecological Society.

Charles F. Nassau (U. of Pa., 1891 and Jefferson, 1906), elected in 1902, did not remain an active member, as general surgery claimed his interest. He died on Aug. 11, 1940, aged 71 years, having been stricken on a fishing trip. In his earlier years he had served as clinical assistant to Lawson Tait, and had taken post-graduate work at Johns Hopkins as well. During World War I he was chief surgeon of Base Hospital 38 (Jefferson Unit), holding the rank of Lieutenant Colonel. At the time of his death he was Clinical Professor of Surgery at Jefferson, Assistant Surgeon to Jefferson Hospital, and held several other institutional appointments as well.

William K. Muller (U. of Pa., 1900) died on Sept. 17, 1940. He was a staff member at Germantown Hospital for many years, but was not particularly active in Society affairs.

P. Brooke Bland (Jefferson, 1901) was Emeritus Professor of Obstetrics at his Alma Mater when he died suddenly on Oct. 31, 1940, aged 65. He was President of the Society in 1928, and well known to all of us, for Dr. Bland's career was a most distinguished one. He had many hospital connections, but the Jefferson Medical College and its Hospital always claimed his chief interest. He served in the Department of Gynecology until he

succeeded Edward P. Davis as Professor of Obstetrics in 1925, which position he voluntarily relinquished to Norris Vaux in 1937. His stewardship was an excellent one. In addition to his professional achievements, Dr. Bland succeeded in securing a valuable collection of rare books which gave him personal delight. The entire collection has been given to the library of Jefferson Medical College. Dr. Bland was a prolific author, and a member of many professional, social and cultural organizations.

Charles S. Barnes (Jefferson, 1897) had a long and useful career as a member of this Society since 1901. He was most faithful as Secretary from 1920 to 1930, and he served as President in 1932–33. For many years, Dr. Barnes was connected with Temple University as Associate Professor of Obstetrics. His death on Dec. 29, 1940, at the age of 78, was a distinct shock to his host of friends and colleagues, for he seemed always to embody perennial youth.

Lida S. Cogill (Wom. Med. Coll., 1890) died on April 19, 1943, aged 74. Since 1938 she had been Emeritus Professor of Obstetrics at her Alma Mater, and had completed fifty years of private practice when she retired in 1941. Soon after graduation, Dr. Cogill aided in founding the West Philadelphia Hospital for Women, which merged with the Woman's Hospital in 1930. In 1923 she succeeded Dr. Alice W. Tallant as Professor of Obstetrics at Woman's Medical College.

Emily Whitten-Auge and *Elizabeth O'Hearn* died within the past five years, the latter from an infection of the hand sustained in the line of duty.

It is of interest to say a few words about the women of our Society:

Emmaline H. Cleveland (Wom. Med. Coll., 1855) was Professor of Obstetrics and Diseases of Women and Children at the Woman's Medical College when the controversy raged about the admission of women to the Society. In fact, it was she whose name was used as a test case at the famous meeting on Nov. 6, 1879, when the admission of women was decided against for a long time to come. Hence she was never a member of our Society.

Anna E. Broomall (Wom. Med. Coll., 1871) succeeded Dr. Cleveland upon the latter's death in 1879, Diseases of Children being dropped from the title. A year later the department was rearranged, Dr. Broomall continuing as Professor of Obstetrics, and *Hannah T. Croasdale* (Wom. Med. Coll., 1870) being appointed Professor of Diseases of Women and Children, while in 1894, the latter became Professor of Gynecology only. Dr. Broomall was one of the seven women finally elected to membership on April 7, 1892, while Dr. Croasdale was elected in 1893.

Ella B. Everitt (Wom. Med. Coll., 1891), elected in 1906, died tragically in an automobile accident in 1922, and a memoir was read in her memory before this Society. It is worthy of note that she was succeeded by our present honored President, Catharine Macfarlane who held the chair until recently, and is now Research Professor of Gynecology in her Alma Mater. With Dr. Macfarlane's election, the narrow-mindedness and injustice of sixty-four years ago, has, we hope, been completely erased, for approximately fifty women physicians are, or have been members of the Society during the past fifty years, and they have had a goodly share of presentations before us.

Since 1900 much has transpired in the proceedings of our organization. Progress has undoubtedly been made, to wit, at a meeting early in that year a paper entitled "When Shall the Uterus be Douched and How Shall it be Done?" was presented by no less eminent a member than Edward P. Davis. On the other hand, much that is still sound prevailed. John G. Clarke, in the same year, spoke on the subject "Non-operative treatment of certain pelvic inflammatory lesions." Wilmer Krusen, in 1901, discussed "Organotherapy in gynecology," in the same year that A. J. Downes presented a paper on "Spinal Anaesthesia in cases contraindicating general anaesthesia."

At a meeting in 1902, "Fibroma of the ovary associated with ascites" was presented by Theodore A. Erck, and Richard Cleeman showed two specimens pertinent to the discussion. Relatively recently the condition, when associated with hydrothorax, has been called "Meigs Syndrome." "Remarks on cesarean section, with a report of *three* cases" was the title of a paper by George M. Boyd in 1903. A year later Marie K. Formad reported a case of "Ovarian cyst with retained menstrual blood." "Motor car miscarriage" was discussed by E. P. Davis on Nov. 11, 1908.

In 1908, it was voted to entertain the members of the American Gynecological Society, meeting in Philadelphia in May of that year, with "a planked shad dinner, on the Delaware River." This plan did not work out however, and a dinner was held instead at the old Majestic Hotel.

On March 2, 1911, Willis F. Manges, by invitation, read a paper entitled "Pelvimetry by means of the roentgen ray," and on Dec. 5, 1912, B. C. Hirst

spoke of the advantage of extra peritoneal Cesarean section in clean and infected cases. On Feb. 4, 1915 B. M. Anspach made the first presentation before the Society on "Experiences with radium in the treatment of carcinoma of the cervix."

In 1913 a joint meeting with the Chicago Gynecological Society was held in Philadelphia. This was the first time that a gathering of this sort was arranged by our Society.

The first joint meeting with the New York Obstetrical Society, at their invitation, was held in New York on March 9, 1910, and the meetings were held alternately there and in Philadelphia, until April 16, 1929 when Boston was included to form an annual Tri-City meeting. This year represents the first lapse in these enjoyable gatherings.

More recently, the Pittsburgh, Baltimore and Washington Societies have joined with us at intervals. Other joint meetings have also been held with the Pediatric, Pathological and Roentgen-Ray Societies, and, on one occasion, with the American College of Surgeons. Local clinics by members of the Society were first organized in 1912, and have been conducted now and then ever since. In 1931 the Constitution and By-Laws were revised and reprinted.

Guest speakers since 1900 include a host of visitors, the names of whom are legion in gynecological and obstetrical circles. Martin, Webster, Pryor, Bonnifield, Peterson, Studdiford, Sr., Cragin, and Graves, all since deceased, are among those who spoke either in the old College of Physicians at 13th and Locust Sts., or in this hall where the first monthly meeting was held on Dec. 2, 1909.

The minute books show that on May 3, 1906, the sum of $100.00 was voted as financial aid to the physicians of San Francisco and other devastated areas who suffered as a result of the earthquake and fire. Protests against unethical advertisements in the *American Journal of Obstetrics* began to be voiced as early as 1913, and have continued at intervals ever since.

Previous wars seemed to affect the activities of the Society very little. Civil War veterans, as noted, were early members. No mention of the Spanish-American conflict appears in the minute books, although several early members took part in it. During World War I, all meetings were held as usual, including the fiftieth anniversary which was celebrated with an elaborate dinner at the Rittenhouse Hotel on May 18, 1918, with Barton C. Hirst, elected to a third term, especially for the occasion, as president. George Kosmak, of New York, Editor of the *American Journal of Obstetrics and Gynecology*, attended as the guest speaker. While the war was in progress, J. A. McGlinn twice addressed the Society in his Naval officer's uniform, telling of the experiences of a gynecologist in the United States Navy. E. A. Schumann was relieved of his duties as Secretary for a time because he, too, served in the Medical Department of the Navy. From available records comparatively few members of the Society, active at that time, seem to have been in the armed forces, but rather than unwittingly slight anyone, I shall mention none others by name.

The situation that we face today is different indeed, and I shall not trespass upon the subject which our retiring President, John C. Hirst, plans to speak. It has been a distinct pleasure for me to bring the history of the Obstetrical Society up to date, so to speak, and I am grateful for your indulgence to a past President, who has and always will treasure his association with all of you.

TRANSACTIONS & STUDIES

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(February 1944)

Memoir of James Pemberton Hutchinson*

By JOHN H. GIBBON

A CASUAL glance through the annals of this College will show in its early and middle history the frequent occurrence of the name of James Hutchinson.

The first of the name, the great-grand-father of the subject of this memoir, was a distinguished physician and a conspicuous patriot in the early days of the Republic. He received his arts and medical (1774) degrees from the University of Pennsylvania and then went to London where he was studying under Doctor Fothergill but war having started he decided to return to Philadelphia. This he did via France and in Paris was given important papers by Benjamin Franklin to be delivered to the American Congress. Nearing the American coast his ship was chased and finally captured by a British man-of-war and he lost all his belongings, including all his accumulated medical books and instruments, but before the capture the young medical man had quietly slipped away in an open boat, landed and later delivered Franklin's dispatches. On arrival he entered the army as a surgeon and later became Surgeon-General of Pennsylvania. At the early age of 27 he became a trustee of the University and in 1789 was made Professor of Chemistry and Materia Medica. He served as physician to the Pennsylvania Hospital from 1777 until his death in 1793, was a founder of this College and its first secretary. He acquired a large and distinguished clientele and when Philadelphia was scourged with yellow fever in 1793 he urged all of his patients, who were able, to leave the city but he remained and devoted himself largely to the care of the indigent victims. He became infected with the disease and died, in his 41st year. This briefly is the history of the first James Hutchinson.

The second, James Howell Hutchinson (1834–1889), a grandson of the first, graduated at the University in arts ('54) and in medicine ('58), served as resident physician at the Pennsylvania Hospital and then studied in Paris and Vienna for two years. On his return he was elected physician to the Children's Hospital (1861) and served until his death (1889). He was acting-assistant surgeon of the U.S.A. during the Civil War and served at the Satterlee General Hospital in West Philadelphia. He was physician to the Pennsylvania Hospital from 1868 until his death and served in like capacity at the Episcopal Hospital. He was very active in the Pathological Society and was made President. For many years he was a manager of the School for the Blind and deeply interested in its welfare. He was devoted to the interests of this College and at the time of his death was serving as Vice-President. According to one of his contemporaries he was "noted for his brevity and correctness in speaking and writing." The late John Ashhurst in a memoir ascribes to him the following qualities; "Good sense, thorough education, truth, honesty, sincerity, gentleness, nobility of soul, love of all that was right and good and hatred and contempt for whatever was mean and vile." In 1862 Doctor Hutchinson married

* Read at the meeting of the College of Physicians of Philadelphia, February 2, 1944.

Anna the daughter of Charles Ingersoll, Esq. and their third child, born on June 3rd, '67, was named James Pemberton.

Before taking up the life of James Pemberton Hutchinson it seemed appropriate to say something of these two progenitors, particularly as his life and character were so similar in so many ways to theirs.

His early education was received at St. Paul's School; he was given his A.B. at Harvard in 1890 and his M.D. at the University of Pennsylvania in 1893. Like his great-grand-father and his father he was, during all his professional life, associated with the Pennsylvania Hospital, first as interne, then as out-patient surgeon, then as surgeon and lastly as consulting surgeon. For many years he was also surgeon to the Episcopal, the Methodist Episcopal and St. Timothy's Hospitals.

During this period he had an enormous surgical experience and few of his contemporaries exhibited equal judgment and skill in traumatic surgery or were able to parallel his results following prostatectomy.

Although he never published a surgical paper he always spoke with logic and knowledge at surgical meetings and his opinions were highly regarded in the American Surgical Association and the Clinical Society of Surgery.

One characteristic of his hospital service was his conscientious devotion to the welfare of his patients. This was manifest even in his interne days when he would make quiet visits to his patients' homes, after their discharge, to make sure they were getting the proper food and medication. It was most often in behalf of children that these visits were made and any lack was supplied from his own pocket. At that time there was no Social Service. This side of his character was unknown to most of his colleagues and friends because he had a certain shyness that prevented him from showing anything that might be called sentiment; in fact he had such a contempt for all forms of exhibitionism that he tried to cover his own sentimental side by a cold exterior, which deceived many casual acquaintances; "il donnait comme on derobe, en se cachant aux yeux de tous" (Victor Hugo).

As a military surgeon he won great distinction in France during the first World War. In the spring of 1915 he went to the American Ambulance in Paris with a unit from the University of Pennsylvania under the late J. William White for a term of four months. This unit was succeeded by one from the Pennsylvania Hospital which he commanded and which remained more or less intact until the end of the war. Later two other outlying hospitals were put under his command and his force greatly augmented by nurses and young physicians sent from this country. On the entry of the United States into the war he was given the rank of major in the Army and after completing four years of continuous work he was retired with the grade of colonel. Few Americans, I think, could claim so long a foreign service. Owing to his ability, his wide experience and his character he earned an enviable reputation as a military surgeon and as an administrator.

In recognition of his services to France he was made a Chevalier de la Légion d'Honneur, was given the Medaille d'Honneur by the French Republic, a war medal by the Union des Femmes de France and a medal by the Citizens of Paris. That his fine record was not without recognition by our own government is shown by the bestowal of the Distinguished Service Medal. He also received the Liberty Service Medal from the American Social Science Association and the National Institute of Social Sciences.

On his return to Philadelphia after the war he decided, much to the regret of his colleagues, to retire from the practice of surgery and resigned from all of his hospital positions. He returned however to the office of assistant Medical Director of the Penn Mutual Life Insurance Co. to which he continued to give a part of his time for many years. He also devoted himself whole-heartedly, as a Manager, to the Episcopal Hospital until within a few years of his death. His chief charitable interest lay in the work of the School for the Blind at Overbrook of which he was elected a Manager in 1894 and President in 1925.

Most medical men reach distinction in their profession by research, by teaching, by contributions to medical literature and activities in medical societies, and by the development of an extensive private practice; in none of these fields was Doctor Hutchinson conspicuous. His reputation and his recognition by his confreres at home and abroad were due to his evident surgical ability and judgment, his wide experience, his forthright and outspoken honesty, and to his moral courage. During and after the war he showed unusual administrative ability. Even those whom he found it necessary to discipline or to demote acknowledged his fairness and honesty and continued to admire him.

Prior to the war he made many trips abroad and

was familiar with the surgical work being done in the various European clinics. After the war he continued to go abroad nearly every winter.

Jim Hutchinson was a sportsman of the highest type. At Harvard he was stroke of his crew and a member of the football team. During his early professional life rowing on the Schuylkill was his favorite exercise. He was an excellent horseman and for a number of years before the war was president of the Rose Tree Fox Hunting Club. Later he was Master of Hounds for six or seven years, filling the role after he was seventy and no one rode straighter. He was an unusually handsome man and retained his fine figure throughout his life.

In 1902 he married Katharine Kelso Cassatt who died in 1905. In 1927 he married Amory Hare Cook, a daughter of our late president Hobart A. Hare. He had no children by either wife.

His death, on April 8th, 1943, in his 76th year, was due to Hodgkin's Disease. He died, as he wished, looking out of his library window over the lovely Crum Creek valley and the undulating hills beyond, covered largely by trees which he had planted.

All who knew him well will agree that his outstanding qualities were fairness, good judgment, honesty and frankness. Of himself, his achievements and his honors he never spoke. He was generous, giving freely to organized charity but more freely in quiet unknown ways. In his last testament he named as his ultimate legatees The Pennsylvania Hospital and the School for the Blind at Overbrook.

Memoir of Albert P. Brubaker*

By RANDLE C. ROSENBERGER†

AN ACQUAINTANCESHIP of almost a half century should give one a good idea of the worthiness of a fellow individual. Such an acquaintance was a happy circumstance in my life in the person of Dr. Albert P. Brubaker who has recently passed to the Great Beyond. It was my good fortune to be a student under this great teacher and in after years to be considered by him as a friend and in still later years as a fellow member in the faculty of Jefferson Medical College.

Dr. Brubaker, with only the most rudimentary and primitive equipment with models and drawings and an occasional eviscerated rabbit, turtle or frog could give the most elaborate and enfolding illustrations and descriptions which were so clear and concise that anyone with very little gray matter could remain not only keenly interested, but fascinated by his dissertations. Mild, reserved, patient, kindly disposed even to the most awkward or stupid inquiry, he remained tolerant, calm, unperturbed and gave his time to each and every one alike. In his blackboard illustrations he was a master—meticulous—and anyone who could not learn something from these was indeed to be pitied.

He was greatly admired by the student body, was revered and was affectionately and respectfully called "daddy," by many graduates of the institution.

In 1901 he was the first one of the Faculty to have the finest up-to-date laboratory of physiology where apparatus and equipment were at hand to record readings of the circulation and test muscle fatigue and other physiological problems. This laboratory was said to be the first of its kind in this country and was planned according to his own ideas.

He was fond and appreciative of good soul stirring music and enjoyed the Philadelphia Orchestra for twenty five years. Not only was he fond of instrumental music but for a long while enjoyed the Orpheus Club of which he was an associate member. He was treasurer of the Musical Fund Society of Philadelphia for a number of years. He enjoyed the theatre but was partial to grand opera. He made twelve trips to Europe and upon each occasion visited the art galleries and museums. I understand that he was quite a keen golfer, had won many cups but quit the game when 76 years of age because so many of his fellow players fatally dropped on the greens.

Dr. Brubaker was graduated from Jefferson Medical College in 1874 and served as assistant in the department of Physiology, teaching Medical Jurisprudence and Hygiene in addition to Physiology. He was appointed Professor of Physiology in 1909 succeeding Dr. Henry C. Chapman; until the time of his retirement in 1927, he served faithfully as a member of the Faculty and as chairman of this body. The trustees appointed him Emeritus Professor of Physiology at the time of his retirement.

Besides teaching Physiology at Jefferson, he also taught in other institutions including the Pennsylvania School of Dentistry and the Drexel Institute.

He was a member of many national and local societies including the American Philosophical Society and the American Physiological Society as well as our College of Physicians. He was a member of the University Club and a charter member of Rho Chapter, Nu Sigma Nu Fraternity. One of his chief joys was membership in the Philadelphia Ethical Culture Society and he served as its president some years ago. Several honorary degrees were conferred upon him by various institutions, among them L.L.D. For a long time he was a member of the library committee of the College of Physicians and later made honorary librarian. He wrote a compend and also a text book on human physiology besides publishing a number of papers on problems of physiology. Dr. Brubaker was influenced a great deal in his professional life by intimate association with his father, Dr. Henry Brubaker who was a general practitioner of Somerset Co., Pa., and widely known for his scientific attainments throughout Western Pennsylvania.

Vacations in his earlier years were spent at Buckhill Falls, Pa., where at that time one could enjoy thorough relaxation and not be disturbed by

* Read at the meeting of the College of Physicians of Philadelphia, February 2, 1944.

† Died February 21, 1944.

the urge to see whether one could stay up all night and next morning.

In September 1942, he fell and broke his femur and was confined to his bed, while life gradually ebbed from his well cared for body until death came to his relief April 29, 1943 at the age of ninety years.

I personally feel his loss greatly and I know that all of us who knew him well will miss him; not only we of the College but all those who came under his influence in one way or another.

Paradoxically Dr. Brubaker is dead, but "People do not die—only when they are forgotten," and I'm sure we will never forget him.

Transactions of the Sections

SECTION ON GENERAL MEDICINE

Regular Meeting, October 25, 1943

The Effect of Artificial Pneumothorax upon the Normal Pulmonary Tissues of Twelve Rabbits. Robert Charr, M.D. (Commentator: Peter A. Herbut*, M.D.)

A Test for Vascular Tone and Its Clinical Applications. Meyer Naide*, M.D. (Commentator: Isaac Starr, M.D.)

Paredrine Hydrobromide. George C. Griffith, Lt. Comm., MC, U. S. N. R. (Commentator: William D. Stroud, M.D.)

Recurrent Fever of Year's Duration. Hobart A. Reimann, M.D., and Allison H. Price*, M.D. (Commentator: Karl Paschkis*, M.D.)

Regular Meeting, November 22, 1943

A Further Report on the Treatment of Subacute Bacterial Endocarditis by the Use of Sulfonamides and Anti-coagulants, with the Presentation of Two Cases. Joseph C. Doane, M.D. (Commentator: George Morris Piersol, M.D.)

Observation on the Clinical Application of Diasone in Human Tuberculosis. Charles K. Petter*, M.D., George W. Raiziss*, PH.D., and F. T. Callomon*, M.D. (Commentator: John A. Kolmer, M.D.)

Liver Necrosis. F. W. Hartman*, M.D.

SECTION ON OPHTHALMOLOGY[1]

Regular Meeting, October 21, 1943

Memoir of J. Milton Griscom, M.D. Charles R. Heed, M.D.

Drusen of the Optic Nerve Simulating Brain Tumor. Joseph Waldman, M.D., N. S. Schlezinger*, M.D., and Bernard J. Alpers, M.D.

Massive Skin-graft. (Moving-picture demonstration.) Edmund B. Spaeth, M.D.

Junius Kuhnt Macular Degeneration. Samuel Altman*, M.D.

Regular Meeting, November 18, 1943

Diabetic Cataract. (Case report.) George J. Dublin*, M.D.

Epidemic Kerato-conjunctivitis. H. Maxwell Langdon, M.D.

Complete Ophthalmoplegia. (Case report.) Van M. Ellis, M.D.

Exudative Choroiditis. I. L. Pavlo*, M.D.

Epibulbar Tumor. W. E. Fry, M.D.

Regular Meeting, December 16, 1943

Concerning the Relations of the Developing Optic Nerve to the Recessus Opticus and Hypophysis. Henry C. Haden*, M.D. (The sixth annual de Schweinitz Lecture.)

SECTION ON OTOLARYNGOLOGY[2]

Joint Meeting[3], October 20, 1943

Laryngeal Injuries following Naso-esophageal Intubation. Joseph Atkins*, M.D. (Commentator: Gabriel Tucker, M.D.)

Thrombosis of the Cavernous Sinus. (Case report.) N. Fulmer Horrman*, M.D. (Commentator: Karl M. Houser, M.D.)

Reticular Cell Lymphosarcoma of the Nasopharynx. (Case report.) Charles E. Towson, M.D. (Commentators: Frank B. Lynch*, M.D., and William Hewson, M.D.)

Joint Meeting[3], November 17, 1943

Percussion Note of the Maxillary Sinus. William Hewson, M.D. (Commentators: William Egbert Robertson, M.D., and Walter Hughson, M.D.)

The Absorptive Capacity of the Nose. Maurice Saltzman*, M.D. (Commentator: Matthew S. Ersner, M.D.)

Rhinoplasties. Round-table Conference I: Anatomic Considerations. Kelvin A. Kasper, M.D. (Commentator: Benjamin H. Shuster, M.D.)

Joint Meeting[3], December 15, 1943

Reconstruction of the Deformed Nasal Septum. A Critical Evaluation of the Orthodox Submucous Resection. Matthew S. Ersner, M.D. (Commentators: Warren B. Davis, M.D., and George M. Coates, M.D.)

* By invitation.

[1] The transactions of this Section are customarily abstracted in the *American Journal of Ophthalmology* and the *Archives of Ophthalmology*.

[2] The transactions of this Section are customarily abstracted in the *Archives of Otolaryngology*.

[3] With the Philadelphia Laryngological Society.

THE FIRST FIFTY YEARS OF THE SECTION ON OTOLARYNGOLOGY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.[4] George B. Wood, M.D. (Commentators: Walter Roberts, M.D., Francis R. Packard, M.D., and Arthur Watson, M.D.)

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

Joint Meeting[5], *October 4, 1943*

PHILADELPHIA'S CATASTROPHE EXPERIENCES. Joseph J. Toland*, jr, M.D.; Ralph W. Lorry*, M.D.; Wharton W. Sinkler*, M.D.; Saverio F. Brunetti*, M.D.; Arthur P. Keegan*, M.D.

Joint Meeting[6], *November 18, 1943*

PANEL DISCUSSION: HOW PHYSICIANS CAN INCREASE THEIR SERVICES TO INDUSTRIAL PLANTS WHICH HAVE INADEQUATELY SUPERVISED NURSING SERVICE.

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* By invitation.

[4] Published, with Dr. Roberts' reminiscences, in the *Transactions & Studies*, December, 1943.

[5] With the Section on Industrial Medicine of the Philadelphia County Medical Society.

[6] With the Section on Industrial Health and Section on General and Industrial Surgery of the Philadelphia County Medical Society; the Industrial Nurses' Association of Philadelphia and Vicinity; the Visiting Nurse Society of Philadelphia.

President's Address*

By O. H. PERRY PEPPER, M.D.

THE President of the College is but the servant of the College; one of his obligatory duties is the making of an annual report to the Fellows concerning "the state of the College." This report obviously must reflect the many activities of the College and of its several officers, its Standing and Appointive Committees, its Sections, and of the Fellowship itself. Many of the details of these matters are boring and would unnecessarily lengthen the President's report, many of them are printed in the *Transactions* and are there available to the Fellows. Not all, however, are published, more perhaps should be, and certainly all should be known to the Fellows, for the sum total of these services, the time and industry, given to the College is in truth a heart-warming evidence of the fine spirit of our College Fellowship and of their affection for this institution and their appreciation of its significance in the complex structure which is Medicine. Few of the Fellows are in a position to do more than suspect the truth, but the President is peculiarly cognizant of it and takes this opportunity to congratulate the College and to thank the Fellowship. The College is what its members make it; their efforts make the task of the President a light and pleasant one.

The organization of the College is not a simple one—in addition to its officers, censors and its Council, there are some fourteen committees not including the officers and committees of the five Sections. It has a Curator of the Mütter Museum, a Librarian and an Honorary Librarian, Trustees of several special funds, an Honorary Director of the Department of Medical Art and an Honorary Legal Counsel. The College employs some seventeen individuals. But, in addition, special committees and tellers must often be called upon by the President and always with a willing response.

It is obviously impossible to mention the work done by each of these several individuals and groups—but it is possible and proper to thank each and everyone in the name of the College and its Fellowship.

Some factual data should be presented. Nine College meetings were held during the year in union with the County Society—four in College Hall and five at the County building. All the meetings were well attended, but the pre-meeting dinners at the College were small. A quorum was present at each of the business meetings. Four of the Sections of the College held successful meetings during the year led by the Section on General Medicine with an average attendance of 99. The Section on Ophthalmology celebrated its Fiftieth Anniversary with a most enjoyable dinner. Of course, the activities of the Sections were greatly lessened owing to present day conditions and the absence of many younger members. In general, the Fellowship of the College increased slightly in spite of a fairly heavy death roll.

In the Armed Forces are 125 Fellows, resident and nonresident, out of a total of 708, which is a creditable figure in view of the inevitable maturity of our membership. This has resulted in a sharp reduction in our income from dues, but the Finance Committee and Treasurer have been able to prepare an almost balanced budget for 1944; only, however, as a result of severe economy by the several officers and committees. In general, it may be said that financially the College is weathering the storm, but is not able to plan any of the improvements or increases in service which it would like to make. Recently, a number of the Fellows have made individual contributions to the current expenses of the College and a most praiseworthy movement is on foot for the Fellows at home to pay to the College a sum equal to the exempted dues of Fellows in service. Before leaving the finances of the College, the President would like to express the deep appreciation of ex-President Krumbhaar's service as Chairman of the Finance Committee. In fact, every Committee has functioned smoothly and efficiently.

The Library Committee has kept the Library in the forefront of American Medical Libraries with the invaluable assistance of our able Librarian, Mr. W. B. McDaniel, 2d. The Hall Committee has not only kept a roof over our heads but has assured us of this for years to come with a complete tentorial renewal.

* Read at the business meeting of the College of Physicians of Philadelphia, January 12, 1944.

The Fellowship is familiar with and grateful for the continuing efforts of the Publication Committee, the Scientific Business Committee, and the Committees on Mütter Museum and College Collections.

For several years there has been going on a closening of relations with the County Medical Society which is well illustrated by our joint meetings and by the very useful activities of our combined committees on Public Health and Preventive Medicine, under the civic-minded leadership of Dr. Joseph Stokes, Jr. Suggestions for merging the library activities of the two organizations have not been productive of a mutually acceptable plan and this may be all for the best, for perhaps the County Society should maintain a current periodical library while devoting most of its funds to the good purposes of organized Medicine, while the College continues to maintain its fine all inclusive library. Possibly greater library privileges should be granted, at a low fee, to any members of the County Society who desire them.

Coordination of the activities of the two organizations should be encouraged, but each should follow its own proper line—with close union wherever possible. Thus our meetings should continue to be held together, at least for the duration, and certainly our joint Committee on Public Health and Preventive Medicine should continue its good work. Within the past year, it has interested itself in a number of important matters including smallpox, venereal disease, salary scale for nurses, the control of food handlers, crime prevention, pasteurization of milk, pollution of water, housing codes, and the appointment of proper officials in the Department of Public Health and in the Coroner's Office.

The College of Physicians is a long established dignified organization; no great change should be expected of it in any one year or even in one decade. The experienced physician knows that he must not too abruptly change the habits of his geriatric patients—so must we, who love and serve the College try first to maintain its high position and secondly, to plan slowly and almost cautiously, to move forward to even better service.

The College is a never ending but always changing group of Fellows—each year losing some by death, but revitalized by new additions. This year we have lost by death sixteen Fellows and one Honorary Fellow. I request the audience to rise in silence while I read their names:

George W. Crile, Honorary Fellow, elected 1909;
died January 7, 1943.

Howard A. Kelly, Non-Resident Fellow, elected May, 1887;
died January 12, 1943.

Harry B. Wilmer, elected a Fellow October 4, 1916;
died January 16, 1943.

Willard G. Mengel, elected a Fellow January 8, 1940;
died January 28, 1943.

J. Alexander Clarke, elected a Fellow January 11, 1926;
died January 31, 1943.

Wilmer Krusen, elected a Fellow March 7, 1900;
died February 9, 1943.

Varnum C. Southworth, Lt. Comdr. U.S.N., elected a Fellow January 9, 1933;
died February 9, 1943.

Howard W. Schaffer, elected a Fellow May 9, 1932;
died February 11, 1943.

Robert G. Gamble, elected a Fellow May, 1899;
died March 12, 1943.

James P. Hutchinson, elected a Fellow, December, 1898;
died April 8, 1943.

Albert P. Brubaker, elected a Fellow June, 1887;
died April 29, 1943.

J. Milton Griscom, elected a Fellow December, 1912;
died June 5, 1943.

William H. Mackinney, elected a Fellow June, 1910;
died June 9, 1943.

George Ernest Johnson, elected a Fellow January 11, 1926;
died August 12, 1943.

Wm. Osler Abbott, elected a Fellow May 7, 1934;
died September 10, 1943.

Gordon J. Saxon, elected a Fellow January 1, 1927;
died October 20, 1943.

Thomas F. Branson, elected a Fellow December, 1903;
died December 8, 1943.

Memoirs will be read of James P. Hutchinson and Albert P. Brubaker at the February meeting and of Wm. Osler Abbott at some later date.

Now that there seems to be some hope of the ending of the war, we can begin to feel some confidence that our College is due to survive. Only a little over a year ago Council voted to take out War Risk Insurance on our building—things must be better, for we would scarcely do this today.

From this report, it seems safe to say that all things considered the state of our College is good and we are doing as well as can be expected. But what of the future? Medicine is facing many problems in the post war period; our Fellows returning from long periods of service in remote areas will need assistance in preparation for their return to their former career. The Government,

the Army and Navy, organized medicine and other agencies are all thinking about these matters, perhaps we also should be studying our possible contribution. Perhaps we should do nothing more than see to it that our library is as complete and efficient as possible; perhaps we should be planning the preparation of lists of refresher reading, perhaps grouping such material along special lines in study rooms; perhaps we should be planning series of refresher lectures, using the Sections of the College in some field, in addition to our regular activities.

No doubt there are other contributions which we might make and the President suggests that Council take thought as to the best machinery to set up for a study of these and other possibilities. Our College must not fail to do its best to help Medicine, our community and our Fellows, and professional colleagues in the post war world.

Annual Report on the Library*

In common with most public and Society reference libraries, our library suffered an unwelcome but inevitable decline in attendance as a result of wartime demands on the medical profession. It is interesting to note, however, that the decline in attendance between 1939 and mid-October, 1943, has been considerably less than that recorded for the years 1914–1918. Though the fellowship is larger now, of course, and use of the library more freely extended, the demands of "total" war might be expected to have caused the opposite result.

Though actual attendance has declined, we have by no means felt out of the war picture. Fellows in service have sent calls for help from the farthest reaches of the country. Photostatic copies of articles in foreign periodicals have frequently been supplied to Government departments and to industrial firms engaged in war production in many parts of the country. One of the most astonishing and heartening features of this extra-mural use of the library has been the number of calls for assistance in historical research coming from non-Philadelphians stationed at posts in such unlikely parts of the world as the West Indies or the State of Oklahoma. In short, the library seems to have spread its light farther than in any other year in our history—thanks in large part, doubtless, to the new edition of the *Union List of Serials*, the Philadelphia Union Library Catalogue, and our consuming desire to make our resources count as fully as possible in the war effort.

Not entirely unrelated to this ambition, possibly, was a very helpful mark of appreciation conferred on the library by the Smith, Kline & French Laboratories, and John Wyeth and Brother, at the instigation of our Fellow and the library's good friend Dr. William L. Long. Each of these houses, members of whose staffs are almost members of our family, made a grant of $1,000 to the library for the year, with the intention of renewing at least some part of the grant in subsequent years. To all concerned the library is happy to make grateful acknowledgement of this substantial assistance. The library is, of course, under obligation to serve the community in every reasonable way it can; but its ability to serve is clearly limited by the funds at its disposal. These are not obtained from the public treasury, nor from subscriptions. They can be augmented, and the ability to serve be thereby increased, only by such generous confessions of dependence and good-will.

Another evidence of kindly feeling that should be recorded was an unexpected gift from Lawrence Reynolds, M.D., roentgenologist and bibliophile of Detroit. Dr. Reynolds generously returned his honorarium as Pancoast Lecturer to the Philadelphia Roentgen Ray Society, with the request that the sum be added to our library's Fund of the Friends of George E. Pfahler.

Three of our major exhibits were devoted to the medical man of the year, Andreas Vesalius, in commemoration of the four-hundredth anniversary of the publication of his *Fabrica*. As our publisher friends the J. B. Lippincott Co. were celebrating this year their 150th anniversary, we signalized the occasion by an exhibit of some of the more notable and interesting of the medical books put out by the house over the years. Dr. Sturgis' Department of Medical Art provided some handsome exhibits, as usual, one of them, of Fellows of the College in uniforms of the First World War, having an especial appeal at this time. It should be observed, in connection with this department, that the director's first annual report appeared in the June number of the *Transactions & Studies*.

That our enemies have no corner on ingenuity and the ability to organize substitute measures has been proved in the field of medical publications, as in so many other ways. The Joint Committee on Importations' project to import axis-controlled periodicals was not successful, so far as we were concerned. Nevertheless, reprints of some of the most important foreign journals in the basic medical sciences have been, and are, on our shelves; microfilm copies of others have been available on a subscription basis; and the Army Medical Library has been extraordinarily generous in furnishing gratis microfilm copies of articles and even of entire issues. All this does not mean that after the war the problems of filling in files for permanent preservation will not be many and great. It is not impossible, however, that the war may bring about, among other revolutions, a radical change in methods of publication, distribution, and use of scientific (and other) literature. It may be that present *ersatz* methods will prove to be stepping stones to a new and more efficient system of disseminating information. What the future may bring in this respect it is possible at present to see only through

* October 16, 1942, to October 15, 1943.

a glass, darkly; but movement is there which in time will assume the clear features of indestructible progress.

In June, the library was headquarters for a very successful two-day regional meeting of medical librarians, a report on which may be found in the number of the *Transactions & Studies* dated as of that month.

The librarian read, in February, a paper on Vesalius' *Fabrica* in the early history of anatomic illustration (drawing on the Packard Collection for lantern slide illustrations) before the Philobiblon Club of Philadelphia. In April he read a paper, "Oliver Wendell Holmes and the College of Physicians of Philadelphia," before the Obstetrical Society of Philadelphia; and another paper, dealing with the creation of the College's Sections, at the 50th-anniversary dinner of its Section on Ophthalmology. The Holmes paper was published, considerably amplified, in the April number of the *Transactions & Studies*. His brief account of our Quintuplets Broadside was reprinted from the *Transactions* in the final (November, 1942) number of the *Annals of Medical History;* and his account of our William N. Bradley Collection was published in the *Bulletin of the History of Medicine* of the same month. He served as chairman of the Philadelphia Metropolitan Library Council's Committee on Specialization, and, in October, 1943, was elected president of the Council. In June, he was elected secretary of the American Association of the History of Medicine, to take office in January, 1944. He continued as editor of the *Transactions & Studies*.

The re-vitalized staff, comprising the Misses Manson, Jackson, Yarger, Haegele, E. and M. Mars, and Mr. Baugh, remained unchanged during the year, worked well and faithfully, and bore out the promise held forth in our report for last year.

There remains to record the sorrow of the Library Committee, the librarian, and the staff on the death, in April, of Dr. Albert P. Brubaker, for some years a member of the committee and, finally, our Honorary Librarian. His gentle, kindly ways and philosophic spirit remain as one of our pleasantest memories.

Inventory

	1943	1942	1943	1942
Total number of accessioned items[1]			160,712	159,188
	1943	*1942*		
Incunabula	414	413		
Manuscripts	631	594		
Other items[2]	159,667	158,181		
	160,712	159,188		
Total number of unaccessioned items[3]			321,191	321,989
Reports and Transactions	25,786	25,696		
Periodicals "reserve"[4]	4,694	4,683		
More or less complete volumes of other periodicals not regularly received	2,664	2,706		
Theses and Dissertations	47,696	47,489		
Pamphlets (less than 100 pages)	240,351	241,415		
	321,191	321,989		
Total number of current periodical publications regularly received			701	670
Duplicate books			14,430	14,522
Portraits[5]			57,750	54,653

[1] An accessioned item may be any kind of material that is kept within covers, whether these be made commercially or in the library, of paper or of more durable material. The accessioned item might comprise, for instance, part of a book, or one or more books; a part of a periodical volume, or one or more complete volumes; reports, pamphlets, or theses, single or collected; an atlas or photograph album, etc.

[2] Including 28 'rare' books acquired during the year.

[3] While the accessioned items contain some material in paper covers, it should be noted that most Reports and Transactions, pamphlets, and theses, also paper-covered, are not accessioned, but that any of them might be, if any intrinsic reason for so doing should present itself.

[4] More-or-less complete duplicate volumes of important and much-used periodicals.

[5] Including 111 oil, and 463 other, framed portraits in the care of the Committee on College Collections. The count of portraits represents the number of entries on the cards in the portrait catalogue. The entries represent, in turn, both loose portraits and those in books, many of them, of course, being merely different reproductions of a single original.

Distribution of This Material

	Accessioned Items	Unaccessioned Items
General Library (including the Lewis Library)	156,487	321,187
On permanent deposit:		
Gross Library	3,808	4
Parry Library of the Obstetrical Society of Philadelphia	217	0
Mütter Museum[6]	200	0
	160,712	321,191

Current Periodicals

Total number of periodicals regularly received in the library: 701 titles

	Purchase	Exchange	Gratis	Annuals & 'Books'	Total
American (United States)	180	65	165	48	458
Australia and New Zealand	1	3	1	2	7
British Isles	65	17	6	5	93
Canada	1	7	8	1	17
Ceylon and India	2	4	1	1	8
China (pub. U. S. A.)	0	1	0	0	1
Cuba and Puerto Rico	1	6	8	0	15
France and Algeria	1	1	0	0	2
Germany	9	0	0	0	9
Mexico and Guatemala	2	6	5	0	13
Philippines (pub. U. S. A.)	0	0	0	1	1
Portugal	0	0	0	1	1
South Africa	0	3	1	0	4
South America	10	19	16	4	49
Switzerland	19	1	2	1	23
Totals, 1943	291	133	213	64	701
Annuals & 'Books'	25	14	25	64	
Grand Totals, 1943	316	147	238		701
Grand Totals, 1942	287	142	241		670
Grand Totals, 1941	602	187	240		1,029
Grand Totals, 1940	645	230	259		1,134
Grand Totals, 1939	688	248	266		1,202

Foreign publications: Of the 23 Swiss journals listed, 13 were no longer current at the end of the year, though receipts had been regular through the earlier months. The German and French publications are available in reproduced form. The single Chinese and Philippine publications were both printed in the United States.

Not included in the tabulation are 55 journals (all but two of them published in the Western hemisphere) of which one or more numbers were added to the files, scattered issues (current or otherwise) having been received by donation.

New titles: Of 43 additions to our list during the year, 21 are received by purchase, 4 by exchange, 18 gratis. Nineteen of these are journals which have recently begun publication and are now on file from the first number issued.

Separate issues received and filed: 7,397 (exclusive of duplicates, 10,090, and of reserves, 674). Of this total, 974 were scattered issues received from Fellows and other donors; and 103 others were previously-lacking back-numbers supplied by publishers or editors in response to claims. This year's total, some 3,400 fewer than that of the year before, is equal to about half the pre-war total. The drop is about equally divided between receipts by mail from publishers and donations from local sources.

Visitors to the Current-periodicals Room during the year were recorded to the number of 3,714—a decrease of 1,470 from the number for the preceding year, and some 3,000 fewer than in the "peak year" of 1940. Of this year's total, some 800 were visitors during the 101 evenings the library was open (only 60 fewer than the year before, when the library was open 20 fewer evenings, however); and 187 were visitors on 33 Sunday afternoons (100 persons fewer than in 1942, when there were 2 fewer Sunday openings).

[6] The books of the Mütter Museum are not permitted to be removed from the College building.

Readers' Use of the Library

Library hours: the library was regularly open daily, except Sunday, from 9 to 6; on Wednesday and Friday evenings until 9:30 (starting June 1 we have been open on Monday evening instead of Friday evening); on Sunday afternoons from 2 to 5:30 (October 4, 1942, to May 23, 1943). From June 1 to September 3, incl., the library was open Mondays to Fridays, incl., from 9 to 5, and closed on Saturdays and Sundays. The library was closed, as usual, on the following legal holidays: Thanksgiving, Christmas, New Year's, and Labor Days.

Number of visitors:

	1943	1942	Fellows 1943	Fellows 1942	Non-Fellows 1943	Non-Fellows 1942	Totals 1943	Totals 1942
Days	(294)	(293)	1,057	1,586	5,137	6,840	6,194	8,426
Evenings	(101)	(84)	77	137	1,063	1,027	1,140	1,164
Sundays	(33)	(31)	39	27	386	474	425	501
			1,173	1,750	6,586	8,341	7,759	10,091

Circulation of books:

	1943	1942
Number of volumes taken out	5,319	7,277
(Books: 2,569; Periodicals: 2,750)		
Number of volumes consulted in the library[7]	30,460	40,725
(Books: before 1700, 50; 1701–1850, 221; after 1850: 7,843)		
(Periodicals: before 1850, 92; 1851–1899, 485; after 1899, 21,769)		

Inter-library Loans: The library has sent 160 (1942: 206) volumes on inter-library loan to 27 (1942: 27) libraries in 10 (1942: 12) States and has borrowed 4 (1942: 17) volumes from 1 (1942: 5) library. There were, as happens each year, a number of requests we could not fill: 14 volumes asked for we did not have; 5 are on the restricted list; 14 requests were for current, unbound journals. Our photostat answered the need in some of these cases, and in many more a knowledge of this service obviously forestalled a request for loan of a volume.

Photostats: 2,009 photostatic prints have been furnished to Fellows (1942: 1,977); 351 prints to non-Fellows (1942: 435); 275 prints to the library (1942: 228). The last include a copy of an incunabulum (bringing the total of photostated incunabula to 315), portraits, rare books on loan, etc.

Acquisitions and Accessions

Received from all sources:[8]

1943: 1,840 volumes (including the bound and accessioned volumes of periodicals, 142 unbound reports and 175 duplicates); 444 pamphlets; 209 theses; 17,566 numbers of various journals.

1942: 2,396 volumes (including the bound and accessioned volumes of periodicals; 81 unbound reports and 652 duplicates); 1,532 pamphlets; 238 theses; 21,614 numbers of various journals.

Accessions:

1943: 1,523 volumes (790 by purchase; 530 by gift; 203 by exchange). (Books, 805; Periodicals, 718.)

1942: 1,663 volumes (809 by purchase; 574 by gift; 280 by exchange). (Books, 658; Periodicals, 1,005).

Donations

The individual donors for the past year number 199 (1942: 231). The library is indebted for large gifts of books, pamphlets, and unbound periodicals to the following donors:

Drs. J. Q. Atkinson, Nathan Blumberg, Burton Chance; F. A. Davis Co.; Drs. C. W. French, Alfred Gordon, E. B. Krumbhaar; Lea & Febiger; Dr. Joseph McFarland; Medical Library Association Exchange; Drs. E. J. Morris, H. H. Morris, E. C. Rice; W. B. Saunders Co.; Drs. W. T. Shoemaker, Walter Sussman, J. M. Swan, Joseph Walsh; John Wyeth & Brother.

Various publishing houses have presented volumes as follows: P. Blakiston's Son & Co., 3 (2 at the request of the authors); F. A. Davis Co., 14; Lea & Febiger, 11; J. B. Lippincott Co., 21; W. B. Saunders Co., 47.

Eight volumes were presented by the following

[7] The number of volumes "consulted in the library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and reference works kept on the shelves in the Reading Room; the Fellows, and occasionally others, by special permission, have access to the book-stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

[8] As usual, not all the pamphlets, theses, and numbers of various journals listed as received had been checked for keeping or discard at the close of the library year.

authors or editors: P. B. Hawk, D. R. Iriarte, W. Kaufman, M. Markowitz, V. Santamarina, J. W. Stockwell, E. A. Strecker, E. Urbach.

Exchanges

The *Transactions & Studies* was sent, either as gift or in exchange for 239 other serial publications, to 291 organizations.

Ninety-four distributions (1,388 unbound journals and 39 bound volumes) have been made through the Medical Library Association Exchange. The library has received twenty-one such distributions.

Theses and dissertations to the number of 156 have been received from the following European schools of medicine with which we exchange publications at the present time: Universities of Basel, Geneva, Lausanne.

Work of the Cataloguers

	1943	*1942*
Accessioned items catalogued or recatalogued	963	903
Unaccessioned pamphlets and Fellows' reprints catalogued by author or by author and subject	1,762	
Reprints (from journals not in the library) entered under the name of the journal (periodicals catalogue)	52	
Cards typewritten, examined and filed	15,220	9,854
Cards revised, typewritten, examined and filed	5,485	7,076

W. B. McDaniel, 2d
Librarian

Approved:
William Egbert Robertson, M.D.
Chairman

Annual Report of the Committees of the Mütter Museum and College Collections

The Museum

The Ordinances and By-Laws of the College require that the Committee of the Mütter Museum shall report annually to Council the condition and activities of the Museum and shall render semi-annual statements bearing on receipts and expenditures on account of the Trust Fund established by the Mütter Deed of Gifts.

Hours. The Museum was open to Fellows of the College, physicians, and the general public, on days when the College Building was open, from 10–1, and from 2–6, except Saturdays when the hours were from 9–1. During these hours the curator and clerk-technician was constantly in attendance. In addition the Museum was open on the evenings of the Stated Meetings of the College and at some of the Sectional Meetings of the College. The curator reports that 725 visitors signed the Register of the Museum during the year.

Thomas Dent Mütter Lecture. The Fifty-fifth Thomas Dent Mütter Lecture was given by Dr. H. Winnett Orr, Chief Surgeon of the Nebraska Orthopedic Hospital, who spoke to a large and interested audience on "Physiologic Protection from Infection in Wounds and Compound Fractures." The lecture was published in the *Transactions & Studies* of the College, February 1943.

Publications, Studies and Exhibits. Two papers based on Mütter Museum specimens and collections were written by Dr. Joseph McFarland, Honorary Curator of the Museum under the general heading "Rummaging in the Museum." One of these papers entitled "The Dead Chinaman," was published in the *Transactions & Studies* of the College, December 1942. The second paper, entitled "Our Old Shoes," was published in the *Transactions & Studies* of the College, June 1943. These interesting and informative papers by Doctor McFarland direct attention to the Museum and are illustrative of an activity that should be continued and extended.

Use was made of certain specimens and collections of the Museum by teachers of the several medical schools and colleges of Philadelphia in presentations before classes of medical students.

The Museum collection of gas masks was loaned to Dr. Edward B. Krumbhaar for a special exhibit at the annual meeting of the Association of Military Surgeons, held at the Bellevue-Stratford in October, 1943. Special exhibits were also arranged in the Museum for the benefit of the visiting members of the Association of Military Surgeons throughout the time of their annual convention.

Change of Titles. Following a joint conference of the Chairman of the Finance Committee and the Mütter Museum, Council of the College on May 25, 1943, approved the recommendation of the Committee of the Mütter Museum that the positions of Curator of the Mütter Museum and of Clerk-Technician of the Mütter Museum be combined as to title, duties and salary. Mrs. Ella N. Wade was appointed to the new position with the title Curator and Clerk-Technician of the Mütter Museum. She assumed her new and extended duties June 1. At the same time, on recommendation by the Committee of the Mütter Museum, Council approved the appointment of Dr. Joseph McFarland as Honorary Curator of the Mütter Museum.

The Permanent Collection of the MütterMuseum. The permanent collection of the Mütter Museum now consists of more than 7179 items. These are catalogued and are available for study within the Museum. The collection consists of anatomical, pathological and anthropological specimens, specimens exhibiting war injuries, models, many instruments of great historic interest, and special collections in varied fields of study.

Accessions to the permanent collection of the Mütter Museum and falling under the provision of the Mütter Deed of Gift during the past year were as follows:

Presented by Dr. Douglas Macfarlan

Richardson's sphygmograph.

Two snares: one formerly belonging to Dr. Fielding O. Lewis; and the other designed by Dr. Curtis C. Eves.

Audiometer (invented by Dr. Guttman), the first of the vacuum tube audiometers.

Presented by Miss Carrie Super

Medicine spoon (designed by Miss Leidy Super about 1890).

Presented by Mr. Simeon Trenner

A candle holder more than fifty years old.
An ear trumpet dating back thirty years.
Plate used in electrophoresis.
A silver watch made in London and dating back seventy-five years.
Holman's life slide.
Thumb lancet.

Presented by Mrs. Peggy Westerfield, Damariscotta, Maine

Apothecaries' scale.
Box of dissecting instruments.

Presented by Dr. Guy Hinsdale

Luer's tonsil guillotine.

Presented by Dr. T. Grier Miller

Two pewter syringes.

Presented by Mrs. James Talley

A Weiss microscope, formerly the property of Dr. James Talley.

College Collections

Herewith is submitted the Report of the Committee on College Collections for the fiscal year ending November 30, 1943.

Dr. Joseph McFarland served as Custodian of College Collections from December 1942 to May 31, 1943 and Mrs. Ella N. Wade served in the capacity of Clerk-Technician for the same period.

At the May meeting of Council the Committee on College Collections recommended that Mrs. Ella N. Wade be appointed Custodian of College Collections and Clerk-Technician and that Dr. Joseph McFarland be appointed Honorary Custodian of College Collections. This recommendation of the Committee was approved by Council, the new arrangement becoming effective as of June 1, 1943.

During the year the oil portrait of Dr. S. Weir Mitchell, now hanging in the President's Room, was renovated by Mr. Justin Pardi, and the portrait of Dr. Francis R. Packard was hung in Mitchell Hall.

Mrs. Ella N. Wade, the Custodian and Clerk-Technician of College Collections read a paper before the Regional Meeting for Medical Librarians which was held at the College June 10–11, 1943, entitled "The Care and Cataloguing of Medals." This paper together with a catalogue of the medals in the College Collection will appear in a future issue of the *Bulletin of the Medical Library Association*.

The following accessions were made to the College Collections:

Presented by Dr. William Zentmayer

Thirty-three badges of the American Medical Association.

Presented by Dr. Edward B. Krumbhaar

1935 American Medical Association badge.
Pi Gamma Mu Medal (Honorary Society of Social Science).

Presented by Dr. Edward F. Corson

Nine British war medals to complete the collection donated by Doctor Corson. There are 26 in the collection. The nine additional consist of:
Indian Mutiny Medal 1857–1858.
Hong Kong Plague Medal 1894.
Waterloo Medal, over one hundred years old.
East and West Africa Medal 1897–1898.
East and West Africa Medal 1873–1874.
Indian Medal 1854.
Long Service and Good Conduct Medal.
Meritorious Service Medal.
New General Service Medal.

Presented by Mrs. Louis A. Biddle

An oil portrait said to be that of Dr. Benjamin Rush and believed painted by Benjamin West.

Presented by Dr. George E. Pfahler

Plaster bust (bronzed) of William Konrad Roentgen done by Cristabel Cummings of Washington, D. C.

Presented by Dr. William N. Bradley

Plaster bust (bronzed) of Dr. Henry Beates, done by Samuel Murray.

J. Parsons Schaeffer, M.D.
Chairman

Annual Report of the Publication Committee

THIS report covers the four numbers of the *Transactions & Studies* published within the College's fiscal year ending November 30, 1943—namely, vol. 10, nos. 3 and 4; vol. 11, nos 1 and 2.

The total number of pages in the four numbers was 171, the amount of text being about 23% under that published in 1942 and about 11% over that published in 1941. All four numbers were printed in the new, wartime, format, estimated to contain 38% more text per page than the old format contained.

Owing to the fact that so many of the guest speakers at the joint scientific meetings were men in service, or otherwise subject to Governmental restrictions, we did not have access to all of the presentations. We therefore sought to supplement those that were available with papers from the Section on Public Health and other sources. The four numbers did include, however, the important lectures of Prof. Edwin J. Cohn, Drs H. Winnett Orr, Paul C. Colonna, and Carl Schmidt. Historical articles from the pens of Drs Chance, Eliason, Krumbhaar, McFarland, O. H. P. Pepper, and the librarian, lent substance to the "& Studies" part of the magazine's title while the memoirs, programs of the Sections, annual and occasional reports, lists of officers and committees, Fellows, etc., kept the fellowship and the world at large in touch with the varied interests and activities of the institution. The editor feels that, so far as the *Transactions & Studies* is concerned, the year was not nearly so disastrous as he had anticipated; and he feels that there remains every reason to put forth the utmost effort to see the magazine through the war years safely, in view of its unique influence in keeping the name of the College prominent among those of like institutions actively contributing to the advancement of the medical sciences and the life of their communities.

There follows a statement of receipts and expenditures:

Receipts

Appropriation	$900.00	
Sales of T & S	21.00	
Income from publication funds	697.85	$1,618.85

Expenditures

Printing, mailing	$1,187.61	
Stenciling	25.90	
Miscellaneous	11.31	1,224.82
Balance, November 30, 1943		$394.03

W. B. MCDANIEL, 2D
Editor

Approved:
JOHN P. SCOTT
Chairman

Report of the Committee on Public Health, Preventive Medicine and Public Relations

In conformity with the custom established during preceding years, the Committee continued to meet monthly with the Committee on Public Health and Preventive Medicine of the Philadelphia County Medical Society as a Joint Committee on Public Health and Preventive Medicine.

At the request of the Department of Public Health, the Joint Committee held an emergency meeting to consider the imminent danger of a smallpox epidemic during January, 1943. The following resolutions were adopted:

1. That vaccinations be performed at Air Raid Posts without the sanction of the Philadelphia County Medical Society, the College of Physicians or the Defense Council.

2. That the Director of Public Health, the Presidents of the College of Physicians and the Philadelphia County Medical Society, and the Co-Chairmen of the Joint Committee on Public Health and Preventive Medicine call an emergency meeting of the Joint Committee when any public health problem arises which in their opinion requires such a meeting.

3. That the Philadelphia County Medical Society through its official bulletin advise physicians to continue vaccinating their patients against smallpox.

4. That a vote of commendation be given Dr. Hubley R. Owen for the efforts of the Department of Health in encouraging persons to be vaccinated against smallpox, and thereby avoiding the possibility of an epidemic.

5. That the Philadelphia County Medical Society through its official bulletin request Philadelphia physicians to furnish information showing the number of smallpox vaccinations performed by them in their private practice as well as in industrial work.

As a result of criticism in the public press concerning the Department of Health and the serious venereal disease conditions in Philadelphia, the Joint Committee, after investigation, approved the issuance of the following statement by the Philadelphia County Medical Society and the College of Physicians:

"The Philadelphia County Medical Society and the College of Physicians of Philadelphia commend the activities of the Department of Public Health and in particular its Division of Venereal Disease Control with which these Societies have been coöperating since its inception in October, 1941.

"These medical organizations have complete confidence in the work which Drs. John H. Stokes, Norman R. Ingraham, Jr., and John W. Lentz are doing in connection with the venereal disease program in Philadelphia.

"A special committee has been formed to make a special study of public health problems in Philadelphia arising from the present war-time emergency, and a copy of its report will be released immediately upon its completion."

The foregoing statement was sent to all Philadelphia newspapers as a release from the joint Societies.

A subcommittee on nursing was appointed to make a study of existing salaries paid nurses in hospitals as well as the duties of private duty nurses in hospitals. The data collected by the subcommittee on these questions were turned over to groups representing the nursing profession and the hospitals which were making similar studies. In addition, the Committee offered its coöperation to the National Nursing Council for War Service in its attempts to furnish the nursing needs of the armed forces and the civilian population.

Approval was given to a proposed City ordinance for licensing various organizations and institutions maintaining and conducting day care for children services.

The Committee considered the problem of the examination of food handlers and prepared a revised plan for such examinations, based on similar plans in operation in other large cities, which was turned over to the Department of Health for its use. This plan was adopted by the Department of Health.

The Committee recommended the approval of the Philadelphia Plan prepared by the Crime Prevention Association of Philadelphia to regulate

and safeguard the health and morals of the people of Philadelphia as a result of problems arising from the war-time emergency.

Through its co-Chairman representing the College of Physicians, the Committee lent its influence to prevent the passage of legislation by the State Legislature which would allow raw milk to be shipped into Philadelphia by removing existing local regulations dealing with the pasteurization of milk.

The pollution of the Schuylkill River was considered by the Committee and the following recommendations looking toward the elimination of this public health hazard were prepared and sent to the Secretary of Health of Pennsylvania, to the Director of Public Health, and to the press:

"Whereas, silt, culm, and sewage deposited in the Schuylkill River over a period of years are seriously endangering the quantity, quality, and safety of the water supply at the Belmont and Queen Lane Pumping Stations and Filtration Plant, and

"Whereas, this condition is becoming more aggravated, and

"Whereas, this silt, culm and sewage are rendering proper filtration more difficult, and

"Whereas, continued introduction of silt, culm and sewage into the filtration system, interfering with the proper processing of water for domestic use, might cause an epidemic of typhoid fever, dysentery, infantile paralysis, or other water-borne diseases, and

"Whereas, there is constant danger of contamination by overflow of the Schuylkill River from accumulation of culm, silt and infectious material from the raw water

"Be it resolved that the Philadelphia County Medical Society and the College of Physicians of Philadelphia, through their Joint Committee on Public Health and Preventive Medicine, urge that the Secretary of Health of the Commonwealth of Pennsylvania, as Chairman of the State Sanitary Water Board, call an immediate meeting of said Board to demand correction or cessation of the introduction of silt, culm and sewage into the waters of the Schuylkill from which the City of Philadelphia draws a large portion of its daily supply of water."

Recommendations were prepared by the Joint Committee on the question of the Department of Public Health of Philadelphia and were sent to Acting Mayor Bernard Samuel and his Mayoralty opponent, Mr. William C. Bullitt. They embodied the following essential items:

1. The qualifications of public health officials and especially their formal training and experience should be considered in making appointments.
2. The Department of Public Health should be free from political influence.
3. Continuity in public office of qualified public health officials as well as continuity of program are essential.
4. Adequate appropriations of funds to carry on the functions of the Department of Health and a comprehensive progressive program consistent with the needs of Philadelphia with special emphasis on the post-war era are of immediate importance.

The Committee also considered the vacancy in the office of Coroner of the County of Philadelphia and recommended that a physician be appointed to this office to succeed Dr. Herbert M. Goddard, deceased.

The Committee met with representatives of the Philadelphia Housing Association and the Division of Housing and Sanitation of the Department of Public Health to consider the subject of the present housing situation and in particular the inspection and reporting of hazards from the standpoint of public health. A plan was worked out whereby the members of the Society were to be furnished with information indicating the manner in which hazards should be reported to the Housing Division, and a list of the most important violations of the Housing and Building Code subject to legal correction. It was felt that this would encourage physicians to take a personal interest in the homes which they visit professionally and thereby cooperate with the authorities in eliminating existing hazards.

Joseph Stokes, Jr., M.D.
Chairman

Fellows

February 29, 1944

ELECTED

1912. Addison, William H. F., Medical Laboratories, Univ. of Pa.
1926. Adler, Francis Heed, 313 S. 17th St.
1914. Aiken, Thomas G., Berwyn, Pa.
1936. Aldridge, Fred Cutler, Wayne, Pa.
1936. Alexander, Fay Knight, Fitzgerald Mercy Hospital, Darby, Pa.
1906. Allen Francis Olcott, Jr., 2216 Walnut St.
1932. Allen, Frederick H., 1711 Fitzwater St.
1935. Alpers, Bernard J., 111 North 49th St.
1933. Alston, Robert S., 121 Walnut Lane.
1905. Anspach, Brooke M., 1827 Spruce St.
1930. Appel, Kenneth E., 111 N. 49th St.
1905. Appleman, Leighton Francis, 308 S. 16th St.
1935. Armitage, George L., 400 E. 13th St., Chester, Pa.
1922. Arnett, John H., 2116 Pine St.
1942. *Aronson, Joseph D.
1941. *Aronson, Roland S.
1920. Astley, G. Mason, 812 N. 63rd St.
1935. Atlee, John L., 37 E. Orange St., Lancaster, Pa.
1935. Atlee, John L., Jr., 37 E. Orange St., Lancaster, Pa.
1914. Austin, J. Harold, 821 Maloney Clinic, Univ. of Pa.
1906. Babbitt, James A., 1912 Spruce Street.
1935. Bach, Theodore F., 1900 Rittenhouse Sq.
1942. *Bachman, Carl.
1937. Bacon, Emily P., 2104 Spruce St.
1916. Balentine, Percy L., 407 Weightman Bldg., 1524 Chestnut St.
1898. Balliet, Tilghman M., 3920 Sansom St.
1940. Banes, Charles C. A., 2043 N. 12th St.
1934. *Bank, Joseph.
1940. Barba, Philip S., 222 W. Harvey St., Germantown.
1943. Barden, Robert P., 3400 Spruce St.
1911. Barnard, Everett P., 1820 S. Rittenhouse Sq.
1939. *Barnshaw, Harold D.
1939. Bartle, Harvey Jr., 133 S. 36th St.
1924. Bartle, Henry J., 1930 Chestnut St.
1931. Bates, William, 2029 Pine St.
1932. Batson, Oscar V., 3502 Hamilton St.
1921. Bauer, Edward L., 1609 Spruce St.
1933. Bauer, John T., Pennsylvania Hospital.
1939. Baumann, Frieda, 1930 Chestnut St.
1922. *Bazett, Henry C.
1938. Beach, Edward Warren, 4400 Walnut St.
1908. Beardsley, E. J. G., 1919 Spruce St.
1930. Beardwood, Joseph T., Jr., 2031 Locust St.
1935. Beerman, Herman, Chatham Court Apts., 49th and Locust Sts.
1932. Behney, Charles A., 3722 Chestnut St.

* On active service.

1942. *Behrend, Albert.
1934. Behrend, Moses, 1738 Pine St.
1930. Belk, William Parks, Times Medical Bldg., Ardmore, Pa.
1936. Bell, Benjamin Tertius, 1930 Chestnut St.
1943. *Berk, J. Edward.
1941. Bernstein, Mitchell, 1321 Spruce St.
1937. Bertolet, J. Allan, 1530 Locust St.
1934. Biddle, Sydney Geoffrey, 255 S. 17th St.
1918. Billings, Arthur E., 2020 Spruce St.
1917. Birdsall, Joseph C., 139 Booth Lane, Haverford, Pa.
1933. Bishop, Paul A., Pennsylvania Hospital.
1917. Block, Frank B., 136 S. 16th St.
1929. Bockus, Henry L., 250 S. 18th St.
1928. Boles, Russell S., Rittenhouse Plaza.
1923. Bond, Earl D., 707 Old Lancaster Road, Bryn Mawr, Pa.
1911. Bonney, Charles W., 255 S. 17th St.
1924. Boon, David J., 1532 N. 15th St.
1931. *Bortz, Edward Le Roy.
1921. Borzell, Francis Frank, 4940 Penn St., Frankford.
1936. Bostwick, Delazon Swift, 106 Linwood Ave., Ardmore, Pa.
1928. Bothe, Albert E., 255 S. 17th St.
1928. Bothe, Frederick A., 255 S. 17 St.
1923. Bower, John O., 2008 Walnut St.
1942. Bowie, Morris A., 910 Old Lancaster Road, Bryn Mawr, Pa.
1907. Boyer, Henry P., 4602 Baltimore Ave.
1925. Boykin, Irvine M., 136 S. 16th St.
1929. Bradbury, Samuel, 151 W. Coulter St.
1907. Bradley, William Nathaniel, 1725 Pine St.
1942. Branen, William, Whitby & Cypress Ave., Yeadon, Pa.
1921. Bransfield, John W., 2101 Spruce St.
1917. Bromer, Ralph S., 318 Milbank Road, Bryn Mawr, Pa.
1936. Brown, Charles L., 325 N. Bowman Ave., Merion, Pa.
1932. Brown, Claude P., 1930 Chestnut St.
1919. *Brown, Henry P., Jr.
1939. Brust, Raymond W., 4710 Chester Ave.
1930. Bucher, Carl Joseph, 271 S. 15th St.
1943. Buerki, Robin C., University of Pa.
1928. Burden, Verne G., 255 S. 17th St.
1940. Burnett, W. Emory, 3401 N. Broad St.
1906. Burns, Stillwell C., 1238 Atwood Rd.
1941. Butler, Miriam, 1831 Chestnut St.
1906. Butler, Ralph, 1930 Chestnut St.
1934. Buzby, B. Franklin, 414 Cooper St., Camden, N. J.
1907. Cadwalader, Williams B., 133 S. 36th St.
1928. *Campbell, Edward H.
1931. Cantarow, Abraham, 2033 Delancey St.
1935. Carey, Lawrence S., 1930 Chestnut St.
1931. Cariss, Walter L., 2043 Walnut St.
1930. Carpenter, Chapin, 1930 Chestnut St.
1905. Carpenter, Herbert B., 1805 Spruce St.
1926. Carpenter, Howard Childs, 1805 Spruce St.

* On active service.

1895. Carpenter, John T., 1930 Chestnut St.
1917. Carson, John B., 1802 Pine St.
1922. Case, Eugene A., 63 W. La Crosse Ave., Landsdowne, Pa.
1937. Castallo, Mario A., 1621 Spruce St.
1943. Castigliano, S. Gordon, 881 Wynnewood Road, Overbrook.
1933. Chamberlain, W. Edward, Temple University Hospital.
1939. Chamberlain, George W., Reading Hospital, Reading, Pa.
1900. Chance, Burton, 317 S. 15th St.
1939. Charr, Robert Kyun Hyun, 2038 Locust St.
1941. *Cheleden, John.
1903. Chrystie, Walter, Bryn Mawr, Pa.
1939. Ciccone, Emmet F., 2021 Murray St.
1929. Clark, Eliot R., 315 S. 41st St.
1934. Clark, Jefferson Hamer, 3701 N. Broad St.
1926. Clerf, Louis H., 1530 Locust St.
1910. Cloud, J. Howard, 11 W. Montgomery Ave., Ardmore, Pa.
1903. Coates, George Morrison, 1721 Pine St.
1908. Codman, Charles A. E., S.E. Corner 42d and Spruce Sts.
1941. *Cohen, J. Gershon.
1907. Cohen, Myer Solis-, 2110 Spruce St.
1888. Cohen, S. Solis-, 1906 Walnut St.
1920. Cole, Charles J., 7926 Park Ave., Elkins Park, Pa.
1934. Colgan, Robert C., 5882 No. Marshall St.
1934. *Collins, Leon Howard, Jr.
1943. Colonna, Paul C., Univ. of Pa. Hospital.
1939. Comroe, Bernard I., 1726 Pine St.
1930. Cooper, David A., 1520 Spruce St.
1941. *Cornelius, Chalmers E.
1911. Cornell, Walter S., Board of Public Education, Parkway and 21st St.
1914. Corson, Edward F., 136 S. 16th St.
1930. *Cottrell, James E.
1924. Cowan, Alfred, 1930 Chestnut St.
1940. *Cowan, Thomas H.
1904. Craig, Frank A., The Henry Phipps Institute, 7th and Lombard Sts.
1942. *Craighill, Margaret D.
1907. Crampton, George S., 2031 Locust St.
1937. *Crane, Martin P.
1920. Creighton, William J., 37 S. 20th St.
1941. Creskoff, Adolph J., 3400 Spruce St.
1920. Cross, George H., Chester, Pa.
1917. Cross, Sumner H., P. O. Box 126, Jenkintown, Pa.
1921. *Crossan, Edward T.
1940. Crowe, Aldrich C., 735 Atlantic Ave., Ocean City, N. J.
1904. Cruice, John M., 407 S. 22d St.
1937. Crump, Jean, 1930 Chestnut St.
1937. Curtis, Lawrence, 255 S. 17th St.
1934. *Custer, R. Philip.
1941. *Cuttle, Tracy D.
1938. Dannenberg, Arthur M., 235 S. 15th St.
1919. Davies, John R., Jr., 2 E. Chestnut Ave., Chestnut Hill.
1936. Davis, David M., 255 S. 17th St.

* On active service.

1937. *Davis, Perk Lee.
1916. Davis, Warren Beagle, 135 S. 18th St.
1935. *Deaver, J. Montgomery.
1902. Dehoney, Howard, 240 S. 13th St.
1935. Deibert, Irvin Elmer, 538 Cooper St., Camden, N. J.
1924. Deichler, L. Waller, 1930 Chestnut St.
1923. De Long, Perce, N. E. Cor. 20th and Chestnut Sts.
1928. Dewees, A. Lovett, Times Medical Bldg., Ardmore, Pa.
1924. Dillon, Edward S., 2016 DeLancey St.
1932. Dintenfass, Henry, 1305 Spruce St.
1920. Diven, John, 326 S. 19th St.
1941. Dixon, Harold M., 4107 Chester Ave.
1920. Doane, Joseph C., 19th and Spruce Sts.
1942. Donnelly, Edward J., 1721 W. Girard Ave.
1933. Donnelly, Joseph C., 2008 Walnut St.
1937. Donnelly, Robert T. M., 255 S. 17th St.
1907. Dorrance, George M., 2101 Spruce St.
1933. *Downs, T. McKean.
1910. Drayton, William, Jr., 2028 Delancey St.
1935. Duane, William, Jr., 1928 Delancey St.
1935. *Duncan, Garfield G.
1937. Dunn, Charles W., 269 S. 19th St.
1942. Durant, Thomas M., Broad and Ontario Sts.
1942. Dyer, W. Wallace, 2016 Delancey St.
1935. *Eads, John T.
1911. Earnshaw, Henry C. Bryn Mawr, Pa.
1936. Easby, Mary Hoskins, 1930 Chestnut St.
1937. Edeiken, Joseph, 1832 Spruce St.
1944. Ehrich, William E., 236 W. Hortter St.
1930. Eiman, John, Cynwyd, Pa.
1911. Eliason, Eldridge L., 326 S. 19th St.
1939. Ellis, Van Mashburn, 1530 Locust St.
1928. Ellison Richard T., 269 S. 19th St.
1936. *Ellson, J. Vernon.
1904. Elmer, Walter G., 1801 Pine St.
1937. *Elsom, Kendall A.
1934. Ely, William C., 3912 Chestnut St.
1932. Engel, Gilson G., 255 S. 17th St.
1942. Erb, William H., 4 Morton Ave., Ridley Park, Pa.
1893. Eshner, Augustus A., 1019 Spruce St.
1905. Evans, William, 500 W. Gay St., West Chester, Pa.
1922. Farley, David L., 4429 Larchwood Ave.
1903. Farr, Clifford B., Bryn Mawr, Pa.
1930. Farrell, John T. Jr., 255 S. 17th St.
1935. *Ferguson, Lewis Kraeer.
1936. *Fetter, Ferdinand.
1935. Fetter, Theodore R., 255 S. 17th St.
1924. Fewell, Alexander G., 1924 Pine St.
1943. Finkelstein, Arthur, 645 Overhill Rd., Ardmore, Pa.
1928. *Fitz-Hugh, Thomas, Jr.
1928. *Flick, John B.

* On active service.

1939. Flippin, Harrison F., 255 S. 17th St.
1940. *Forrester, James S.
1941. Fox, C. Calvin, 1806 Spruce St.
1906. Fraley, Frederick, 71st and City Line, Overbrook, Pa.
1941. *Frazier, William Doane.
1939. *Freeman, [illegible]rman E.
1935. Fridy, Cyrus Ward, 322 Riverview Ave., Drexel Hill, Pa.
1942. Friedman, Reuben, 877 N. 6th St.
1933. Fritch, James Scott, 269 S. 19th St.
1937. *Fritz, Herbert H.
1940. *Fry, Kenneth E.
1935. Fry, Wilfred Eyles, 1819 Chestnut St.
1937. Furlong, Thomas F., Jr., Times Medical Building, Armore, Pa.
1935. Gammon, Geo. D., Univ. of Pa. Hospital.
1931. Garner, Vaughn C., Germantown Professional Building.
1935. *Geist, Donald C.
1917. Gerhard, Arthur H., 1615 N. Delaware Ave.
1899. Gibbon, John H., Media, Pa.
1934. *Gibbon, John H., Jr.
1939. Gibson, Glen Gregory, 255 S. 17th St.
1933. Gifford, U. Grant, Kennett Square, Pa.
1920. Gill, A. Bruce, 1930 Chestnut St.
1931. *Gilman, Robert Louis.
1927. Gilmour, William R., 413–14 Weightman Bldg., 1524 Chestnut St.
1931. Giordano, Anthony A. S., 1819 S. Broad St.
1906. Gittings, John C., Harwood, Md.
1906. Goepp, R. Max, 1333 Chestnut St.
1933. Goldburgh, Harold L., 1932 Spruce St.
1935. Goldsmith, N. Ralph, 136 S. 16th St.
1905. Gordon, Alfred, 1520 Spruce St.
1928. *Gordon, Burgess L.
1937. Gordon, William, 1721 Pine St.
1941. *Gouterman, Joseph I.
1894. Graham, Edwin E., 1713 Spruce St.
1926. Grant, Francis Clark, Univ. of Pa. Hospital.
1933. Greenbaum, Sigmund S., 320 S. 18th St.
1940. Greene, Lloyd B., 136 S. 16 St.
1932. *Griffith, George C.
1934. Griffith, John Q., Jr., 214 Glencoe Ave., Upper Darby, Pa.
1941. *Groff, Robert A.
1933. Gruber, Charles M., Jefferson Medical College.
1932. Guequierre, Jacques P., Mermont Plaza, Bryn Mawr, Pa.
1935. Hadden, Samuel B., 37 S. 20th St.
1935. *Haines, Harlan F.
1939. Hamblock, Leonard C., 255 So. 17th St.
1894. Hamill, S. McC., 1822 Spruce St.
1897. Hand, Alfred, 1724 Pine St.
1938. *Hand, John G.
1932. Harris, Stanley E., Lansdowne, Pa.
1929. Harrison, Francis G., 1900 Spruce St.
1933. Harrison, William John, 135 S. 17th St.

* On active service.

1903. Hart, Charles D., 420 W. Mermaid Lane, Chestnut Hill.
1941. Hartley, Harriet L., 1719 Rittenhouse Square.
1932. Hartman, J. Calvin, 100 W. Walnut Lane.
1926. Hartmann, Fred L., 1914 Pine St.
1935. Haskell, Benjamin F., 1426 Spruce St.
1907. Hatfield, Charles James, Henry Phipps Institute, 7th and Lombard Sts.
1911. Heed, Charles R., 1205 Spruce St.
1927. Herman, Leon, 136 S. 16 St.
1924. Hewson, William, 6013 Greene St.
1924. Hirst, John C., 2d, 500 N. 20th St.
1908. Hitchens, Arthur Parker, Medical School, Univ. of Pa.
1943. Hitschler, William J., 8840 Germantown Ave.
1944. Hneleski, Ignatius S., Phila. General Hosp.
1943. Hockaday, Agnes, 316 Shadeland Ave., Drexel Hill, Pa.
1939. *Hodes, Philip J.
1905. Hodge, Edward B., 2019 Spruce St.
1931. Holland, H. Albert, 8200 Crittenden St., Chestnut Hill.
1933. Hollingshead, Irving W., 123 S. 18th St.
1932. Hollingsworth, I. Pemberton P., 411 N. Walnut St., West Chester, Pa.
1919. Hopkins, Arthur H., 1726 Pine St.
1925. Hopkinson, R. Dale, Jenkintown, Pa.
1928. Houser, Karl Musser, 2010 Spruce St.
1938. Howell, John Carnett, 326 S. 19th St.
1937. *Hughes, Joseph.
1939. Hughes, P. Boland, Alden Park Manor, Germantown.
1892. Hughes, William E., 3945 Chestnut St.
1937. Hughson, Walter, Abington Memorial Hospital, Abington, Pa.
1923. Hume, John E., N.E. Corner 20th and Chestnut Sts.
1921. *Hunter, Robert John.
1926. Husik, David N., 1820 Spruce St.
1934. Hustead, Frank H., 5112 N. Broad St.
1935. Ingleby, Helen, Woman's Medical College.
1921. Ivy, Robert H., 1930 Chestnut St.
1917. Jackson, Chevalier, 255 S. 17th St.
1932. Jackson, Chevalier L., 255 S. 17th St.
1934. Jacobs, Maurice S., 1831 De Lancey Place.
1941. *Jeffers, William A.
1913. Jeffreys, William H., 143 Gray's Lane, Haverford, Pa.
1928. John, Rutherford L., 256 S. 21st St.
1942. *Johnson, Julian.
1938. *Johnson, Thomas A.
1918. Jonas, Leon, 255 S. 17th St.
1943. *Jones, Charles Alexander.
1924. Jones, Harold W., 1930 Chestnut St.
1900 Judson, Charles F., 252 Kent Road, Wynnewood, Pa.
1902. Jump, Henry Draper, 1530 Locust St.
1936. Kain, Thomas M., 403 Cooper St., Camden, N. J.
1938. Kasper, Kelvin A., 135 S. 18th St.
1941. Kauffman, M. Luther, Medical Arts Bldg., Jenkintown, Pa.
1923. Kay, James, 600 W. Olney Ave.
1938. Keeler, Harold R., 1824 Spruce St.

* On active service.

1935. Kelley, George F. J., N.E. Cor. 20th and Chestnut Sts.
1932. Kelly, Herbert T., 1900 Spruce St.
1909. Kelly, James A., 1815 Spruce St.
1912. Kelly, Thomas C., 105 School Lane.
1941. Kennedy, Patrick J., 6910 Market St., Upper Darby, Pa.
1921. *Kern, Richard A.
1935. *Keyes, Baldwin L.
1930. *Kimbrough, Robert A., Jr.
1936. *King, Orville C.
1920. Klauder, Joseph V., 1934 Spruce St.
1920. Klein, Thomas, 250 S. 18th St.
1934. *Klemmer, Roland N.
1934. Kline, Oram R., 414 Cooper St., Camden, N. J.
1932. Klopp, John W., 618 W. Lehigh Ave.
1943. Kneedler, William H., 8801 Crefeld St.
1919. Knipe, Norman L., 1930 Chestnut St.
1908. Knowles, Frank C., 2035 Spruce St.
1938. Knox, Andrew, 1930 Chestnut St.
1925. Knox, Harry E., 719 66th Ave., Oak Lane.
1914. Kolmer, John A., Cynwyd, Pa.
1936. Konzelmann, Frank Williamson, 3638 N. 21st St.
1932. Kornblum, Karl, 1923 Spruce St.
1941. *Krall, J. Thomas.
1904. Krauss, Frederick, 1930 Chestnut St.
1941. Krewson, William E., 3rd, 1930 Chestnut St.
1914. Krumbhaar, Edward B., School of Medicine, Univ. of Pa.
1907. Langdon, H. Maxwell, 1530 Locust St.
1933. Langdon, Roy L., 5917 Greene St., Germantown.
1941. *Langner, Paul H., Jr.
1934. *Laplace, Louis B.
1926. Laws, George M., 1907 Spruce St.
1936. Leaman, William G., 3700 Baring St.
1920. Leavitt, Frederic Headley, 1527 Pine St.
1941. *Leberman, Paul R.
1934. Lee, Thomas B., 622 Cooper St., Camden, N. J.
1908. Lee, Walter Estell, 1833 Pine St.
1942. Lehman, James A., 1815 Spruce St.
1936. Lehrfeld, Louis, 1321 Spruce St.
1935 Lemmon, William T., 1930 Chestnut St.
1943. Leopold, Irving H., Univ. of Pa. Hospital.
1920. Leopold, Simon S., 255 So. 17th St.
1933. Levering, J. Walter, Abington Memorial Hospital, Abington, Pa.
1915. Lewis, Fielding O., Providence Road, Media, Pa.
1938. *Lewis, James P.
1936. Lillie, Walter I., 255 S. 17th St.
1940. *Limberger, William A.
1938. *Lindauer, M. August.
1927. Lindsey, Walter H., 810 W. Dauphin St.
1936. Lintgen, Charles, 1930 Chestnut St.
1936. Llewellyn, Thomas H., 739 N. 40th St.
1941. Lockwood, John S. 301 Hathaway Lane, Wynnewood, Pa.

* On active service.

1907. Lodholz, Edward, Medical Laboratories, Univ. of Pa.
1931. Loewenberg, Samuel A., 1905 Spruce St.
1938. Long, Charles-Francis, 1836 Delancey St.
1933. *Long, Esmond R.
1935. Long, William L., 2025 Walnut St.
1893. Longaker, Daniel, 5702 Overbrook Ave.
1931. Longaker, Edwin P., 41 E. Montgomery Ave., Ardmore, Pa.
1942. Lownes, John B., 136 S. 16th St.
1936. *Lucchesi, Pascal Francis.
1921. *Lucké, Balduin H. E.
1924. Ludy, John B., 136 S. 16th St.
1932. Lukens, Francis D. W., Cynwyd, Pa.
1938. Lukens, Philip Jefferson, Jr., 158 E. Butler Ave., Ambler, Pa.
1930. Lukens, Robert M., Medical Arts Bldg., 16th and Walnut Sts.
1929. Lull, Clifford, B., Women's Bldg., Penna. Hosp., 807 Spruce St.
1939. Luongo, Romeo A., 2054 Locust St.
1919. Lynch, Frank B., Jr., Germantown Hosp., Penn and Chew Sts.
1914. Lyon, B. B. Vincent, 1930 Chestnut St.
1933. McAndrews, Leo F., Mermont Plaza, Bryn Mawr, Pa.
1932. McCahey, James F., 1534 Pine St.
1900. McCarthy, Daniel J., 2025 Walnut St.
1936. McCarthy, Patrick A., Central Medical Bldg.
1935. *McClenahan, William U.
1931. McCloskey, Edward, 7 E. Chestnut Ave., Chestnut Hill.
1942. McCloskey, John F., 8720 Germantown Ave.
1935. McConnell, James W., 20th and Chestnut Sts.
1934. McCouch, Grayson P., Medical School, Univ. of Pa.
1938. McCrea, Lowrain E., 1930 Chestnut St.
1937. McCutcheon, Morton, Alden Park Manor, Germantown.
1942. *McDonald, P. Robb.
1895. McFarland, Joseph, 542 W. Hortter St., Germantown.
1937. *McGuinness, Aims C.
1940. *McLaughlin, Edward F.
1933. *McLaughlin, James S.
1924. McMillan, Thomas M., 2044 Locust St.
1924. McPhedran, F. Maurice, Germantown Hosp., Penn and Chew Sts.
1943. Macfarlan, Douglas, 1805 Chestnut St.
1932. Macfarlane, Catharine, 136 S. 16 St.
1936. MacMurtrie, Wm. J., 912 S. 49th St.
1939. Macneill, Norman N., 5807 Chew St.
1935. Maeder, LeRoy M. A., 13th and Chancellor Sts.
1935. Maier, Ernest G., 1323 N. 15th St.
1914. Maier, F. Hurst, Wood-Norton Apts., Johnson and Wayne, Germantown.
1942. *Manges, Lewis C., Jr.
1936. Mann, Bernard, 2019 Pine St.
1937. Margolies, Alexander, 1836 Delancey St.
1941. Martin, James R., 136 S. 16 St.
1935. *Mason, James B.
1935 Matthews, Robert A., 111 N. 49th St.
1939. May, Hans, 5501 Greene St.
1932. *Meade, Richard H., Jr.

* On active service.

1934. *Mecray, Paul M.
1914. Mencke, J. Bernhard, 1816 Spruce St.
1941. *Mendell, Theodore H.
1943. Meranze, David R., 1031 Lakeside Ave.
1937. Meyer, George Phillip, 410 Haddon Ave., Camden, N. J.
1935. Miller, Ford A., 4016 Chestnut St.
1934. Miller, Hugh McCauley, 1614 Locust St.
1939. Miller, Malcolm W., 2021 W. Girard Ave.
1939. Miller, Merle M., 6013 Greene St.
1932. Miller, M. Valentine, 114 W. Phil-Ellena St.
1921. Miller, T. Grier, Univ. of Pa. Hospital.
1937. Missett, Joseph Vincent, Jr., 1814 Spruce St.
1904. Mitchell, Charles Franklin, 2003 Pine St.
1932. Mohler, Roy W., 1806 Spruce St.
1936. *Montgomery, Hugh.
1936. Montgomery, John B., 1930 Chestnut St.
1932. Montgomery, Thaddeus L., 2031 Locust St.
1928. Moon, Virgil H., Jefferson Medical College.
1935. Moore, John Royal, Beury Bldg., Broad St. and Erie Ave.
1924. Moorhead, Stirling W., 1523 Pine St.
1936. *Morgan, David R.
1893. Morris, Elliston J., 225 Upland Way, Wayne, Pa.
1941. *Mucklé, Craig Wright.
1929. Mudd, Stuart, Department of Bacteriology, Medical School, Univ. of Pa.
1935. Mullen, Carroll Richard, 2025 Locust St.
1934. *Mullen, Edward A.
1905. Muller, George P., 1930 Spruce St.
1930. Murphy, Douglas P., 3722 Chestnut Street.
1934. Murphy, Eugene C., 1841 S. Broad St.
1905. Mutschler, Louis H., 1625 Spruce St.
1936. Nelson, Guy M., 255 S. 17th St.
1943. Nelson, Waldo E., 615 Moreno Rd., Narberth, Pa.
1905. Newcomet, William S., 3501 Baring St.
1938. Newton, Zachariah B., 7109 McCallum St., Mt. Airy.
1935. *Nicholson, Jesse Thompson.
1899. Nicholson, William Rufus, 1930 Chestnut St.
1941. Nisbet, Verner, 254 S. 45th St.
1905. Norris, Charles C., Darby and Goshen Roads, Bryn Mawr, Pa.
1938. *Norris, Robert F.
1941. *North, John Paul.
1933. Nylin, Josef B., Univ. of Pa. Hospital.
1941. Odenatt, Wm. Burrill, 1213 W. Lehigh Ave.
1913. O'Neal, Alexander Hay, St. Davids, Pa.
1936. *Orr, Theodore E.
1913. Outerbridge, George W., 1927 Spruce St.
1915. Owen, Hubley R., 319 S. 16th St.
1897. Packard, Francis R., 304 S. 19th St.
1933. Palmer, Harold Dean, 111 N. 49th St.
1909. Parish, Benjamin Dores, 1927 Spruce St.
1940. *Parker, Alan P.
1931. Paul, John Davis, 3112 N. Broad St.

* On active service.

1932. Payne, Franklin L., Univ. of Pa. Hospital.
1943. Pearson, Gerald H., 111 N. 49th St.
1922. Pelouze, P. S., 1737 Chestnut St.
1909. Pemberton, Ralph, Paoli, Pa.
1930. Pendergrass, Eugene P., Univ. of Pa. Hospital.
1932. Pennell, Howard Y., West Chester, Pa.
1939. *Pepper, D. Sergeant.
1914. Pepper, O. H. Perry, Univ. of Pa. Hospital.
1902. Pepper, William, School of Medicine, Univ. of Pa.
1916. Percival, Milton Fraser, 2332 S. Broad St.
1942. Perkins, William Harvey, 1025 Walnut St.
1940. Pessel, Johannes F., 224 West State St., Trenton, N. J.
1937. *Pettit, Horace.
1905. Pfahler, George E., 1930 Chestnut St.
1915. Pfeiffer, Damon B., Meadowbrook, Pa.
1935. Phillips, Arthur W., 3904 Walnut St.
1911. Piersol, George Morris, Univ. of Pa. Hospital.
1933. *Pillsbury, Donald M.
1922. Pleasants, Henry, Jr., West Chester, Pa.
1937. Polk, David Stewart, Rosemont, Pa.
1932. Porter, Roland De Lance, Jenkintown, Pa.
1931. Pryor, Charles Allen, 1910 Spruce St.
1943. *Radbill, Samuel X.
1931. Ramsey, Frank M., Chestnut Hill.
1913. Randall, Alexander, 136 S. 16 Street.
1941. Rankin, Charles A., Ludlow & Heather Rd., Upper Darby, Pa.
1926. *Ravdin, I. S.
1941. Rea, Marion Hague, 141 Montgomery Ave., Bala-Cynwyd, Pa.
1938. *Read, Hilton Shreve.
1928. Reese, Warren S., 1901 Walnut St.
1925. Reeves, Rufus S., 2227 Spruce St.
1931. Regester, Robert P., 255 S. 17th St.
1920. Rehfuss, Martin E., 131 St. George's Rd., Ardmore, Pa.
1921. Reiff, E. Paul, 1927 Spruce St.
1937. Reimann, Hobert A., Jefferson Hospital.
1919. Reimann, Stanley P., The Lankenau Hospital Research Institute, Girard and Corinthian Aves.
1929. de Rényi, George S., 212 S. 39th St.
1923. Repplier, Sidney J., 373 Roumfort Rd., Mt. Airy.
1936. Richards, James L., Haverford Villa, Ardmore, Pa.
1919. Richardson, Russell, 320 S. 16th St.
1919. Ridpath, Robert F., 1737 Chestnut St.
1942. Riggs, Helena E., 37 S. 20th St.
1936. Ritter, Joseph A., 2405 N. 54th St.
1933. de Rivas, Damaso, 1831 Chestnut St.
1942. Rivers, Thurston D., 111 N. 49th St.
1932. *Robbins, Frederick R.
1939. Roberts, Ella, 133 S. 36th St.
1899. Roberts, Walter, 1921 Spruce St.
1932. *Robertson, Harold F.
1903. Robertson, William Egbert, 327 S. 17th St.
1938. Roche, Philip Q., 255 S. 17th St.

* On active service.

1912. Rodman, John Stewart, 1726 Spruce St.
1934. Rogers, Harry L., Riverton, N. J.
1928. Rose, Edward, Univ. of Pa. Hospital.
1936. Rose Elizabeth Kirk, 426 Owen Rd., Wynnewood, Pa.
1932. Rothrock, Harry A., West Chester, Pa.
1936. Rothschild, Norman, 245 S. 16th St.
1933. *Rowntree, Leonard George.
1937. Roxby, John B., R.D. 1, Souderton, Pa.
1941. *Royster, Hubert A., Jr.
1943. Rubin, Mitchell I., 1740 Bainbridge St.
1933. Rudolphy, Jay Besson, 230 S. 21st St.
1929. Ryan, William J., 136 S. 16th St.
1936. Sands, Joseph Evans, Rosemont, Pa.
1905. Sartain, Paul J., 2006 Walnut St.
1908. Sautter, Albert C., Germantown Professional Bldg.
1920. Scarlett, Hunter W., 230 S. 21st St.
1939. Scattergood, Joseph, Jr., 115 S. High St., West Chester, Pa.
1917. Schaeffer, J. Parsons, 4634 Spruce St.
1929. Scheffey, Lewis C., 255 S. 17th St.
1942. *Scheie, Harold G.
1929. *Schenck, Harry P.
1917. Schnabel, Truman G., 1704 Pine St.
1917. Schoff, Charles H. Media, Pa.
1928. *Schofield, Frederick S.
1921. Schumann, Edward A., 1814 Spruce St.
1930. Scott, John Porter, 1740 Bainbridge St.
1940. *Scott, T. F. McNair.
1924. Shallow, Thomas A., 1611 Spruce St.
1908. Shannon, Charles E. G., 1930 Chestnut St.
1928. Sharpe, John S., Haverford, Pa.
1928. Sharpless, Frederick C., Rosemont, Pa.
1897. Sharpless, William T., West Chester, Pa.
1931. *Sheehan, William C.
1932. Sheridan, Joyce T., 412 W. Durham St.
1943. Shewbrooks, Daniel M., Penn Mutual Life Ins. Co., 6th and Walnut Sts.
1936. Shipman, James Shelby, 255 S. 17th St.
1935. *Shoemaker, Robert, 3rd.
1939. *Shumway, Norman P.
1936. Shuster, Benjamin H., 1824 Pine St.
1941. *Silcox, Louis E.
1903. Sinclair, John F., 4103 Walnut St.
1907. Sinkler, Francis W., 136 S. 16th St.
1928. Skillern, Samuel R., 1734 Pine St.
1933. Smelzer, Donald Campbell, Germantown Hosp., Penn and Chew Sts.
1929. *Smith, Austin T.
1933. *Smith, Lauren Howe.
1937. Smith, Lawrence Weld, Temple School of Medicine.
1936. Smith, Richard Manges, 4727 Oakland St.
1927. Smyth, Calvin Mason, Room 451, Methodist Hospital, Broad and Wolf Sts.
1941. Snyder, G. Gordon, Mermont Apts., Bryn Mawr, Pa.
1935. Sokoloff, Martin J., 255 S. 17th St., Phila.

* On active service.

1940. Soloff, Louis A., 2032 Pine St.
1935. Sommer, George N. J., 120 W. State St., Trenton, N. J.
1928. Spaeth, Edmund B., 1930 Chestnut St.
1937. Spangler, John Luther, Devon, Pa.
1935. Spiegel, Ernest, 6807 Lawnton Ave., Oak Lane.
1929. Sponsler, Marshall B., 1737 Chestnut St.
1894. Stahl, B. Franklin, Haverford, Pa.
1909. Starbuck, J. Clinton, 42 East Washington St., Media, Pa.
1927. Starr, Isaac, 505 Cresheim Valley Rd.
1936. Steinfield, Edward, N.E. Cor. 18th and Chestnut Sts.
1942. *Stengel, Alfred, Jr.
1901. Stevens, Arthur A., 314 S. 16th St.
1914. Stewart, Thomas S., The Barclay, 18th and Rittenhouse Sq.
1941. Stewart, Winifred B., 2028 Delancey St.
1931. *Stiles, Merritt H.
1934. Stimson, Cheney M., 167 Harvey St., Germantown.
1925. Stokes, John H., 4228 Spruce St.
1928. Stokes, Joseph, Jr., 1740 Bainbridge St.
1943. Stokes, S. Emlen, 129 Chester Ave., Moorestown, N. J.
1923. Strecker, Edward A., 111 N. 49th St.
1923. Stroud, William Daniel, 1011 Clinton St.
1937. Strumia, Max M., Bryn Mawr Hospital, Bryn Mawr, Pa.
1933. Stuckert, Harry, 248 S. 21st St.
1937. Sturgis, Margaret C., 1930 Chestnut St.
1927. Sturgis, Samuel Booth, 34 W. Montgomery Ave., Ardmore, Pa.
1934. Summey, Thomas J., 255 S. 17 St.
1930. Sunderman, F. William, 2210 Delancey St.
1936. Surver, James Miller, 1832 Spruce St.
1928. Swartley, William B., 6002 Greene St.
1934. Sweeney, John A., 1900 Rittenhouse Sq.
1943. Tassman, Isaac S., 136 S. 16th St.
1933. Taylor, Herbert W., Haverford, Pa.
1931. Taylor, Norman H., 100 W. Evergreen Ave.
1928. Thomas, J. Earl, Drexel Hill, Pa.
1907. Thomas, T. Turner, 1636 Francis St.
1942. *Thompson, Wesley, D., Jr.
1927. Thorington, J. Monroe, 2031 Chestnut St.
1898. Thornton, Edward Q., 1331 Pine St.
1936. Thornton, Mary Bickings-, 2703 West Somerset St.
1936. Thorp, Francis Quicksall, 4900 Penn St.
1936. Thudium, William J., 136 S. 16 St.
1935. Tocantins, Leandro Maués, 45 Woodale Rd.
1935. Toland, Owen J., Episcopal Hospital, Front and Lehigh Ave.
1941. Tompkins, Pendleton, 807 Spruce St.
1936. Towson, Charles Emory, Germantown Professional Bldg.
1908. Tracy, Stephen E., 1930 Chestnut St.
1926. Tucker, Gabriel, 326 S. 19th St.
1938. Tuft, Louis, 1530 Locust St.
1933. Tumen, Henry J., 1900 Rittenhouse Sq.
1938. Turman, Christopher M., Wyncote, Pa.
1935. Turnbull, William G., Phila. General Hospital.

* On active service.

1923. Turner, Creighton H., 1731 Pine St.
1929. Tyson, Ralph M., 255 S. 17th St.
1937. *Uhle, Charles A. W.
1907. Ullom, Josephus T., Carpenter and Quincy Sts.
1934. Ulrich, George A., 309 S. 12th St.
1937. *Vander Veer, Joseph B.
1937. Van Loon, Emily Lois, 1930 Chestnut St.
1933. Vastine, Jacob H. 2nd, 136 S. 16 St.
1912. Vaux, Norris Wistar, 807 Spruce St.
1940. Voegelin, Adrian W., Germantown Professional Bldg.
1941. *Vogel, Stoughton R.
1903. Wadsworth, William S., 3914 Baltimore Ave.
1927. Wagers, Arthur J., 1429 Spruce St.
1928. *Wagoner, George W.
1938. *Waldman, Joseph.
1906. Walker, John K., Media, Pa.
1907. Walker, Warren, 1819 Chestnut St.
1932. Walkling, Adolph A., 136 S. 16 St.
1904. Walsh, Joseph, 136 S. 16 St.
1895. Watson, Arthur W., 2013 Locust St.
1932. Watt, Charles C., Jr., 6605 Wayne Ave.
1933. Waygood, James Jamison, 3464 School Lane.
1941. Weaver, Ruth H., 1719 Rittenhouse Square.
1930. Weeder, S. Dana, 6110 Greene St.
1920. Weidman, Fred D., 20 Tenby Rd., Llanerch, Pa.
1933. Weiss, Benjamin P., The Lenox, 13th and Spruce Sts.
1923. Weiss, Edward, 269 S. 19th St.
1935. Whelan, G. L., 2100 Walnut St.
1921. Whitaker, William, 6771 Germantown Ave.
1936. White, Ellen Pawling Corson-, 1820 Pine St.
1925. Widmann, Bernard P., 250 S. 18th St.
1936. Wilder, Theodore S., Germantown Professional Bldg., Greene and Coulter Sts.
1914. Willard, De Forest P., 1726 Spruce St.
1935. *Willard, John Harrington.
1939. Willauer, George, 1930 Chestnut St.
1907. Williams, Carl, School Lane and Greene St.
1924. Williams, Horace James, 5908 Greene St., Germantown.
1937. Williams, John C., 6370 Germantown Ave.
1920. Williams, Philip F., 2206 Locust St.
1927. Williamson, Ernest G., 6353 Woodbine Ave.
1921. Wilson, George, 133 S. 36th St.
1942. Wilson, Lucius R., 1305 Morris Road, Wynnewood, Pa.
1937. Wilson, Ross B., 1820 S. Rittenhouse Sq.
1902. Wilson, Samuel M., 1930 Chestnut St.
1897. Wilson, W. Reynolds, Villa Nova, Pa.
1940. *Winchell, A. Vaughn.
1941. *Wirts, C. Wilmer.
1904. Wister, James W., 5430 Germantown Ave.
1933. Wohl, Michael G., 1727 Pine St.
1918. Wolferth, Charles C., 26 Raynham Rd., Merion, Pa.
1942. *Wolman, Irving J.

* On active service.

1893. Wood, Alfred C., 2035 Walnut St.
1932. *Wood, Francis C.
1900. Wood, George B., N.E. Corner 20th and Chestnut Sts.
1903. Wood, Horatio C., 319 S. 41st St.
1897. Woodward, George, W. Willow Grove Ave., Chestnut Hill.
1928. Wright, Carroll S., 1402 Spruce St.
1937. Yaskin, Joseph C., 1832 Spruce St.
1943. Yawger, Nathaniel S., 1524 Chestnut St.
1941. Young, Barton R., Temple University Hosp.
1894. Zentmayer, William, 1930 Chestnut St.
1933. Zulick, J. Donald, Abington Memorial Hospital, Abington, Pa.

Non-Resident Fellows

ELECTED

1903. Biggs, M. H., Rutherfordton, N. C.
1937. *Braceland, Francis J.
1936. Brown, Clark E., Dept. Pathology, University of N. Carolina, Chapel Hill, N. C.
1908. Cadbury, William W., 260 E. Main St., Moorestown, N. J.
1936. Camero, Anthony R., 657 S. Westlake Ave., Los Angeles, Cal.
1936. Clarke, Francis Mann, 116 New St., New Brunswick, N. J.
1937. Conaway, W. P., 1723 Pacific Ave., Atlantic City, N. J.
1936. *Cooper, Melbourne J.
1897. Dorland, W. A. Newman, 1236 N. Dearborn Parkway, Chicago, Ill.
1905. Evans, Joseph S., Jr., 1300 University Ave., Madison, Wis.
1933. Fowler, Kenneth, 2535 Horton Ave., San Diego, Cal.
1935. Fretz, John Edgar, "Hillcrest" College Hill, Easton, Pa.
1913. Gates, Nathaniel, 10 Peterboro, Detroit, Mich.
1936. Guthrie, Donald, 118 S. Wilbur Ave., Sayre, Pa.
1902. Gwyn, Norman B., 109 Madison Ave., Toronto, Canada.
1936. Hatch, Lerleen Clement, 747 Ardmore Ave., Akron, O.
1928. *Hayman, Joseph Marchant, Jr.
1892. Hinsdale, Guy, 815 N. Atlantic Ave., Daytona Beach, Fla.
1933. Hitzrot, Lewis H., Medical Director, Mercersburg Academy, Mercersburg, Pa.
1936. Hughes, Brady A., 5005 42d Place, North, Birmingham, Ala.
1899. Jopson, John H., Waverly Mills, S. C.
1931. Kinney, Willard H., 7300 Atlantic Ave., Ventnor, N. J.
1935. McGuire, Hunter H., 105 N. Braddock St., Winchester, Va.
1900. McReynolds, Robert Phillips, 213 S. Broadway, Los Angeles, Cal.
1936. *Middleton, William Shainline.
1915. Musser, John H., 1430 Tulane Ave., New Orleans, La.
1937. Nicholson, Samuel T., 2d, The Hill School, Pottstown, Pa.
1905. Norris, George W., Dimock, Pa.
1899. Parke, Wm. E., 5637 LaGorce Drive, Miami Beach, Florida.
1926. Paul, John Rodman, Dept. Internal Medicine, Yale University, New Haven, Conn.
1907. Price, George E., Stimson Bldg., Seattle, Wash.
1904. Ravenel, M. P., 203 Westmont Ave., Columbia, Mo.
1936. *Reisinger, John A.
1907. Royer, B. Franklin, The Hall, R. D. 7, Chambersburg, Pa.
1913. de Schweinitz, George L., 85 E. Broad St., Bethlehem, Pa.
1941. *Shands, Alfred R., Jr.

* On active service.

1932. Siegel, Alvin Erdreich, Medical Arts Building, Macon, Ga.
1934. *Stewart, Sloan G.
1900. Swan, John M., 457 Park Ave., Rochester, N. Y.
1930. Thorpe, Edward S., Jr., Medical Director, St. Paul's School, Concord, N. H.
1913. Vail, William Penn, Blairstown, N. J.
1897. Veasey, Clarence Archibald, 1569 Paulsen Medical and Dental Bldg., Spokane, Washington.
1931. Walker, Herschel Carey, 320 Park Ave., New York City, N. Y.
1903. Weber, Charles H., 3 Arch Bay, Laguna Beach, California.

Honorary Fellows

Limited to Fifty, of Whom Twenty May be Foreigners

American

ELECTED

1917. Miner, Charles Howard, B.S., M.D., Member of Board of Directors, Wilkes-Barre General Hospital; Board of Health, Wilkes-Barre; Board of Directors, White Haven Sanitarium Association and Penna. Tuberculosis Society. 264 S. Franklin St., Wilkes-Barre, Pa.
1936. Richards, Alfred Newton, PH.D., SC.D., M.D. (HON.), L.L.D., Professor of Pharmacology, School of Medicine, Vice-president in charge of Medical Affairs, Univ. of Pa. School of Medicine, Univ. of Pa., Phila.
1942. Russell, Frederick Fuller, M.D., Brig. Gen. Med. Corps, U. S. A. (Ret.). Harvard Medical School, Boston, Mass.

Foreign

1928. Archibald, Edward, M.D., Col., R.C.A., M.C., H. O. Med. Services, Elgin Bldg., Ottawa, Ontario.
1937. Dale, Sir Henry Hallett, C.B.E., F.R.S., M.A., M.D., F.R.C.P., Director, National Institute for Medical Research, Hampstead, Eng. Mt. Vernon House, N.W. 3, Hampstead, London.
1924. Hopkins, Sir F. Gowland, M.D., Biochemical Department, University of Cambridge, Cambridge, England.
1922. McCarrison, Sir Robert, K.T., C.I.E., M.D., D.SC., LL.D., F.R.C.P., Major-General, Indian Medical Service (retired). 18 Linton Rd., Oxford, England.
1928. Rolleston, Sir Humphrey, BART., G.C.V.O., K.C.B., M.D., D.C.L. (*Durh.*), LL.D., D.SC., Martins, Haslemere, Surrey, England.

Honorary Associates

1942. Conklin, Professor Edwin G., Princeton University, Princeton, N. J.
1942. Donner, William Henry, Lincoln-Liberty Bldg., Philadelphia, Pa.

Necrological List

Resident Fellows

	Date of Election	*Date of Death*
William Osler Abbott	May, 1934	September 15, 1943
Thomas F. Branson	December, 1903	December 14, 1943
Charles W. Burr	April, 1892	February 19, 1944
Albert P. Brubaker	June, 1887	April 29, 1943
Alex. H. Davisson	December, 1900	February 29, 1944
J. Milton Griscom	December, 1912	June 8, 1943
James P. Hutchinson	December, 1898	April 9, 1943

* On active service.

Resident Fellows—*Continued*

	Date of Election	*Date of Death*
George Ernest Johnson	January, 1926	August 13, 1943
William H. Mackinney	June, 1910	June 11, 1943
Caspar Morris	May, 1886	February 29, 1944
Randle C. Rosenberger	January, 1909	February 21, 1944
Gordon J. Saxon	January, 1927	October 21, 1943

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Harlan Shoemaker	October, 1908	December 11, 1943

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